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# CONNECTIONS

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The EERI Oral History Series

**Ugo  
Morelli**

Robert Reitherman  
Interviewer

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## Ugo Morelli

Robert Reitherman, Interviewer



Earthquake Engineering Research Institute

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# The EERI Oral History Series

This is the twenty-first oral history in the Earthquake Engineering Research Institute's series, *Connections: The EERI Oral History Series*. EERI began this series to preserve the recollections of some of those who have had pioneering careers in the field of earthquake engineering. Significant, even revolutionary, changes have occurred in earthquake engineering since individuals first began thinking in modern, scientific ways about how to protect construction and society from earthquakes. The *Connections* series helps document this important history.

*Connections* is a vehicle for transmitting the fascinating accounts of individuals who were present at the beginning of important developments in the field, documenting sometimes little-known facts about this history, and recording their impressions, judgments, and experiences from a personal standpoint. These reminiscences are themselves a vital contribution to our understanding of where our current state of knowledge came from and how the overall goal of reducing earthquake losses has been advanced. The Earthquake Engineering Research Institute, incorporated in 1948 as a nonprofit organization to provide an institutional base for the then-young field of earthquake engineering, is proud to help tell the story of the development of earthquake engineering through the *Connections* series. EERI has grown from a few dozen individuals in a field that lacked any significant research funding to an organization with nearly 3,000 members. It is still devoted to its original goal of investigating the effects of destructive earthquakes and publishing the results through its reconnaissance report series. EERI brings researchers and practitioners together to exchange information at its annual meetings and, via a now-extensive calendar of conferences and workshops, provides a forum through which individuals and organizations of various disciplinary backgrounds can work together for increased seismic safety.

The EERI oral history program was initiated by Stanley Scott (1921–2002). The first nine volumes were published during his lifetime, and manuscripts and interview transcripts he left to EERI are resulting in the publication of other volumes for which he is being posthumously credited.

The Oral History Committee is including further interviewees within the program's scope, following the Committee's charge to include subjects who: 1) have made an outstanding career-long contribution to earthquake engineering, 2) have valuable first-person accounts to offer concerning the history of earthquake engineering, and 3) whose backgrounds, considering the series as a whole, appropriately span the various disciplines that are included in the field of earthquake engineering. Scott's work, which he began in 1984, summed to hundreds of hours of taped interview sessions and thousands of pages of transcripts. Were it not for him, valuable facts and recollections would already have been lost.

Scott was a research political scientist at the Institute of Governmental Studies at the University of California at Berkeley. He was active in developing seismic safety policy for many years, and he was a member of the California Seismic Safety Commission from 1975 to 1993. Partly for that work, he received the Alfred E. Alquist Award from the Earthquake Safety Foundation in 1990.

Scott received assistance in formulating his oral history plans from Willa Baum, Director of the University of California at Berkeley Regional Oral History Office, a division of the Bancroft Library. An unfunded interview project on earthquake engineering and seismic safety was approved, and Scott was encouraged to proceed. Following his retirement from the University in 1989, Scott continued the oral history project. For a time, some expenses were paid from a small grant from the National Science Foundation, but Scott did most of the work pro bono. This work included not only the obvious effort of preparing for and conducting the interviews themselves, but also the more time-consuming tasks of reviewing transcripts and editing the manuscripts to flow smoothly.

The *Connections* oral history series presents a selection of senior individuals in earthquake engineering who were present at the beginning of the modern era of that field. The term "earthquake engineering" as used here has the same meaning as in the name of EERI—the broadly construed set of disciplines, including geosciences and social sciences as well as engineering itself, that together form a related body of knowledge and collection of individuals that revolve around the subject of earthquakes. The events described in these oral histories span many kinds of activities: research, design projects, public policy and broad social aspects, and education, as well as interesting personal aspects of the subjects' lives.

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# Foreword

The interviews with Ugo Morelli that formed this oral history were conducted between Ugo Morelli and me between 2005 and 2012 in Ugo's home in Washington, D.C. The review comments of Oral History Committee member William Anderson are gratefully acknowledged, along with the work of Gail Shea, consulting editor to EERI, who carefully reviewed the entire manuscript and prepared the index, as she has on the previous volumes in the series. George Mattingly was responsible for the page layout work. Maggie Ortiz, Program Associate of EERI, also assisted in seeing this publication through to completion.

Robert Reitherman  
Chair, EERI Oral History Committee  
March 2013



# Personal Introduction

This series of histories published by EERI presents the personal recollections of the giants of earthquake engineering in the 20th century. Engineers and scientists. Great technical minds, one and all.

Except for Ugo Morelli.

He is not an engineer. He does not have a technical mind. But he is without a doubt one of the greats of the earthquake engineering field. Thanks to his work, the fruits of those other great minds made their way into the work of hundreds of thousands of engineers throughout this country and others.

Innovative design ideas bubble up during challenging projects at private engineering firms. Lessons are learned when the effects of earthquakes on real buildings are examined. Insights into the behavior of materials and systems are developed at universities and research labs. Ugo's genius was his ability to bring together the people who developed these bits of new knowledge, to have them work together, often donating their time, to create a distillation that could be used by any competent engineer to design a building that would better withstand earthquakes. And more than that, Ugo's genius was in understanding how to work within the federal bureaucracy year after year, through changing political climates, to get his multi-decade vision consistently funded.

How did he become involved with earthquake engineering? By his own account, it was purely by happenstance. A temporary two-week job taken in the early 1970s when his professional life was in flux introduced him to the field of emergency preparedness. At that time, the idea that the federal government could play an important role in reducing the effects of natural disasters through preparation and prevention rather than through merely picking up the pieces afterwards was a novel and compelling vision. That vision drove Ugo's work for the rest of his professional life.

As a federal employee, he witnessed the birth of FEMA, NEHRP, BSSC and other organizations that played key roles in the earthquake engineering field in the late 20th century. He

soon developed his master plan, a vision of a multi-decade effort that would eventually lead to radically improved building design standards for earthquake resistance. Key features of the overall vision were to provide: 1) guidance appropriate for the varying levels of expected earthquake shaking that existed across the country; 2) guidance for attaining varying levels of performance in response to that shaking; 3) guidance for improving existing buildings as well as for building new structures.

He didn't come up with the plan by himself: he brought together experts and asked them what was needed. But once the plan had been envisaged, it became the roadmap for all his professional efforts. He never succumbed to the easy way out for federal managers who fund research projects: funding the latest hot button topic, the issue-of-the-day, the knee-jerk reaction to the latest disaster. He stuck to the plan and sought out proposals for projects that would, step-by-step, build a body of knowledge, build engineering community consensus support for that knowledge, and move the knowledge into common practice.

I worked with Ugo for ten years, from 1989-1999. When I first met him, his hair was already white and the top of his head was already bare. But he was not an elderly bureaucrat at the end of his career; he was at the top of his game. He knew what he wanted to accomplish, but he also knew that he did not have the background necessary to evaluate some of the technical aspects of the projects he was funding. He gave a small contract to the National Institute of Standards and Technology to provide him with someone to look over the engineering portions of his projects. When I came to work at NIST I was assigned to work on that FEMA contract. I became an observer of the entire process. I never saw the behind-the-scenes machinations that Ugo went through at FEMA to get the funding to continue his efforts, but I saw his occasional frustration with the process and with changes in administration, and his determination to stay on track and complete the entire plan.

Ugo was always meticulous about adhering to the letter and spirit of federal acquisition regulations. He had an especial horror of being (mistakenly) seen as accepting any kind of gift. At out of town meetings, he drove more than one person crazy by refusing to eat

the sandwiches brought in so that the group could work through lunch. The host engineer would have to rustle up some assistant who could figure out how much the sandwiches had cost the firm, calculate the cost of a single sandwich, write out a bill for Ugo, accept cash from him, find change from petty cash, and issue an invoice marked “paid.” All this before Ugo would sit down and eat the d\_\_\_\_ sandwich.

Although he was determined to remain in control of the overall plan, when it came down to producing the actual work and to running the meetings where the work was reviewed, he was not controlling at all. I don’t think he ever chaired a meeting in all the time I worked with him. He spent most meetings listening. How was the work going? What were the obstacles? What was needed to get over those obstacles? What could he do to help the work move forward?

When I look back on the ten years I spent working with Ugo, I remember the day-to-day work of many small tasks: reviewing proposals, organizing meetings, marking up drafts, preparing presentations. I was vaguely aware of the big picture, the overall plan, but I never saw it as clearly at the time as I did yesterday, when I read the draft of this oral history. It makes a great story. But I’ll let Ugo tell it to you in his own words.

Diana Todd  
January, 2013



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The EERI Oral History Series

**Ugo Morelli**



# Growing Up in Massachusetts and Italy

*When I finished third grade in Medford, Massachusetts, my parents decided that they wanted me to have a classical education back in Italy.*

**Reitherman:** Let's begin with when you were born.

**Morelli:** Let me give you a little vignette. It's early fall, on the second floor of one of those three-story houses that dot the landscape in the neighborhoods of the suburbs of Boston, Massachusetts. It's a three-story wooden house, with a piazza on each floor on the front and the back. In the front room of the second floor are two men, one is thirty-ish, rather athletic. He looks tired, but there's a glow on his face. And the other one is an older man, mustachioed, shorter, sitting at an old piano. Out of the piano rolls—these are things you see only in antiques stores these days—come the tinny, martial strains of the triumphant march of the second act of Verdi's *Aida*. In the adjacent room of the same apartment is a young woman, obviously exhausted, with an older woman taking care of her. There's a midwife, and there's a newborn baby. The baby is a boy, and it is me, a firstborn, and only child, as it turned out.

The time is shortly after 9:00 pm. The address is 66 Winchester Street, Medford, Mass., a small town a bit northwest of Boston. The date is October 2, 1922.

The younger man in the parlor is my father, Michele Morelli, and the older man is an uncle. In the adjacent room the young woman is my mother, Genoveffa, née Flammia, who had just gone through eighteen hours of labor. The older woman is an aunt, married to the mustachioed older man in the parlor, who wouldn't let my mother go to a hospital because "only poor people went to hospitals," and babies otherwise were born in private homes.

Parenthetically, history does not record what tune would have been played if I had turned out a girl, but my guess is that it would have been the "Miserere," "Have Pity on Us," from Verdi's *Il Trovatore*, a lugubrious melody, as some of you opera lovers know.

I haven't been back to Medford since 1931, but I had the need to check the map of the area on the Internet recently and it looks like the streets haven't changed, and Winchester Street and St. Clement's, where I was baptized, are still there.

## Emigration of Morelli's Father to the United States

**Morelli:** I was born into what must have been at the time a typical working class Italian immigrant family. My father had come to this country the first time in 1906. He was sixteen at the time, the middle son of the Morelli family that had some land in Grottaminarda, Italy—not thousands of acres, but maybe scores of acres, because in that part of Italy the laws of

inheritance divided up the land each generation into smaller and smaller plots. They were not rich, but they were well-established farmers. I have not done any genealogical research on either my father's or my mother's families. A distant relative, however, has done some and tells me that the Morellis have been in that same area since the turn of the 1800s, participating in the history of that area (Carpignano), including the construction of the Franciscan Monastery and attached church.

My dad always had a streak of rebellion in him. He liked neither farming nor the prospect of becoming the designated clergyman in that particular generation of Morellis. In the past, the family had always had a man of the cloth, but my dad, even though a religious person, could not countenance the thought of entering the orders. So, at age sixteen, he didn't run away from home, he just decided to leave home. He told his parents, and his father wrote a note to a tenant farmer who had worked on the Morelli land in Italy who had immigrated a number of years earlier to Boston, in the North End, of course. Michele arrived with that one contact, though penniless I imagine, and only a grammar school education. Boston in those days was expanding its subway system and expanding into the Back Bay. There were a large number of buildings being built, and he went into the construction industry. He didn't stay in that line of work very long: he saw too many people killed and a lot of people maimed—this is four or five generations before OSHA. He went into the hotel business doing various jobs. At one point he was a bartender, which I find hard to imagine because my dad was rather withdrawn.

## World War I

**Morelli:** At the beginning of World War I, my dad volunteered to return to Italy and, as he put it, defend his country. He went through a very, very trying thirty months of front-line duty on the Austrian front and saw the worst of the type of fighting that is described in *All Quiet On The Western Front*. (Being tall for those days, over six feet, he was a grenadier, one who launched grenades by hand in trench warfare—the rocket-propelled type being at least twenty-five years in the future.) Toward the end of World War I, he transferred to the Carabinieri, the national police force, and saw duty in parts of central Italy that were dominated by the socialists. (The socialists in Italy in those days were very close to the communists, and were radical leftists.) At the end of World War I he went back to his native town, Grottaminarda, in southern Italy—a small town of perhaps 2,000 in his day, and you might have to count some of the cows to reach that high a figure. It's located high in the Apennines (about 1,800 feet in altitude), in the province of Avellino, in the region of Campania (Italy is divided in sixteen or eighteen regions). It was on the national route that at that time connected Napoli in the west with Foggia in the east—covered only with asphalt in the early 1930s. EERI members may know of the reconnaissance report on the Campania-Basilicata earthquake of 1980, which by accident I happened to be associated with, but that's a long ways from here as far as the chronology is concerned—I will come to that later. It is mainly an agricultural area, producing wheat, corn, olive oil, and grapes, the latter grown along wires strung high between trees, so that the land underneath could be

used for other products. Although cultivated since Roman times, the soil remains fertile as a result of the sporadic dusting of ashes from the Vesuvio, located thirty to thirty-five miles away. One theory is that the name comes from a corruption of “Crypta Minervae” or Grotto of Minerva, hence “Grottaminarda.” I do not know when it was founded, but I have heard about prehistoric remains being found in the area. In any case, by the seventh century it was significant enough that the local feudal lord had substantial fortifications built for protection of the local population against the marauding Saracens. Two massive round towers and one square tower still remain and have recently been restored and transformed into a museum. By 1623—that date is documented—it was large enough to sustain a rather substantial church (Santa Maria). Perched on the highest point of the town, the church is still in use. As a matter of fact, I recently heard that, as an earthquake hazard reduction measure, the top floor of the square-shaped steeple (where the clock bells were formerly located) was removed and the bells housed on a lower level of the steeple.

## Marriage of Michele Morelli and Genoveffa Flammia

**Morelli:** Let me pick up the story about my mother. She was the last girl in the fairly large Flammia family in Grottaminarda, and the darling of the family. They lived in the center of town. Her dad had a strange combination of business activities: he was a wine merchant and also had a construction supply store. The wine business didn't survive him, but the construction business did, under his son, until the 1960s. I don't believe she finished grammar

school, but as was common for young women at the time and place, she was taught to crochet, knit, embroider—activities that she carried on until she was no longer physically able to in her 80s. (Her handiwork still adds many special touches to our apartment’s decoration, and I still wear vests that she knitted.) She was also taught to play the mandolin and acquired a taste for good music, which is something she passed on to me and that reinforced my dad’s love for good music, which in his case was opera. Incidentally, she was one of the relatively few who saw Halley’s Comet twice. She also remembered as a child feeling the Messina earthquake in 1908 and also a day when the “day never rose”—it stayed dark because of an ash fall from the Vesuvius.

In those days in Italy there was a certain amount of arranging of marriages. The Flammiias and Morellis knew each other, and somehow the marriage between my dad and my mother was arranged and occurred in July of 1920—my mother having recovered from the Spanish flu only a few months earlier. Literally a few days later they left to come to the United States, my mother for the first time and my dad for the second time.

My dad really didn’t have what we would call today marketable skills, having worked a little bit in the construction business, a little bit in the hotel business, and then had been in the war (World War I) as a soldier. I believe there was a recession about the time they arrived in Boston, and I’m not sure how he found his next job, except that it was through someone who knew the family. He went to work for the Freeport Marble and Tile Company. His mechanical abilities must have been in

his DNA, because he had no training. In any case, in combination with a skill in reading blueprints—also self-taught—it enabled him to become a valued machinist cutting, finishing, and polishing marble with a steady job throughout the Depression. My dad had adapted to American life rather well and liked it, and became a citizen in 1926. He spoke English with a heavy accent, but rather fluently.

My mother on the other hand never really became acclimated to this country or became a part of American life. She learned more English than I think she let on, but it was halting. I can remember as a preschool child acting as her interpreter—as far back as I can recall I could speak Italian, which we always spoke at home, and English, which I do not know how I learned. My mother was very attached to her extremely close-knit family and suffered from being apart from them. She became a U.S. citizen in 1948, undoubtedly spurred by the scary thought that during World War II she was theoretically subject to internment as an enemy alien.

## **Back to Italy After the Third Grade**

**Morelli:** In 1924, when I was about a year and a half old she took me to Italy, while my dad remained in the States. We stayed there for almost three years, during which time I contracted a serious lymph node infection from a vaccine that had turned bad—not surprising, given the lack of refrigeration. I still have the scars for the several incisions that were made to help me get over it. In 1927 we came back to this country. At age five I had already gone back and forth across the Atlantic twice

on ocean liners that in those days were considered to be fast, but which still took ten or twelve days to make the crossing from Italy. I remember the ship on that 1927 trip back to the U.S. It was the *Saturnia*. About three days out of Boston we ran into a terrific storm that lasted at least two days. I realize today the storm was a hurricane, but it was not recognized as such back then. The ship suffered damage to the command bridge and there were injuries among both passengers and crew.

We settled again in Medford and on Winchester Street, now living across the street from the house where I was born. My recollection is that those days were very pleasant for me, nurtured by a hard-working father and a very doting mother. (She accompanied me for the few blocks to school and picked me up every day.) I had only a few friends, but did not miss not having more. I remember romping around the campus of Tufts College, riding a tricycle up and down the unpaved sidewalk of our block, playing with my marbles, and reading a lot of the children's books that my parents regularly ensured that I had.

When I finished third grade in Medford, Massachusetts, my parents decided that they wanted me to have a classical education back in Italy. So we packed again, and my mother and I went back to Italy, while my father again stayed in Massachusetts. We arrived in Grotaminarda shortly after the earthquake of 1932. Grotaminarda is located near a small fault that I think breaks—with a more dependable recurrence period than Parkfield's—every twenty to twenty-five years, because there was one quake when my mother was an infant, the one in 1932, one during World War II, then

the next one was in 1980, which I alluded to already. I was given private tutoring by the Catholic Dean (*Arciprete*) of the town, because, although my Italian was good, I had not gone through my formal studies in that language. He prepared me to take the exams to enter the public education system. In those days in Italy, and it has not changed today, the public system was by far the best. There are private schools and universities, as well as boarding schools, but those run by the government are the best, and in order to get into them—even at a grammar school grade level—you have to take and pass an exam.

I need to digress for a moment at this point to describe the Italian educational system, as background to what follows. It consisted of five years of grammar school, five of junior high or middle school (*gimnasio*) and three of high school (*liceo*), after which students went directly into professional universities for what we call undergraduate and graduate studies. There were progressively stiffer exams at the end of grammar, junior high, and high school levels, the latter determining forever—at least in my days—who could go on to become a professional. Counter-intuitively, there was a tuition charged for the junior high and the high school years, but the universities were free. (I do not know if the system has changed much to this day.)

### **Grammar School in Fermo, Junior High in Avellino**

**Morelli:** I passed the exam and went directly to grammar school (fifth grade) in a small town on the Adriatic side of the Italian peninsula, in the region of Marche, in a town called Fermo,

where my mother and I lived with my uncle, the town tax collector. It was a beautiful medieval town, with some remnants going back to Roman times, with the mother church on the top of the hill—I can still see it in my mind’s eye. On a clear day you could see the coast on the other side of the Adriatic. There I finished grammar school, passing the first of several tests required if I was to eventually go on to college. My parents decided that I would enter a government-run boarding school to continue my education. It was not very far from Grot-taminarda, in Avellino (the seat of the provincial government), and it was the most expensive and the best public school one could find under the circumstances. My recollection of my boarding school days is not very pleasant, however. It was a highly structured life, regulated down to the minute. I couldn’t wait for summer vacations. I felt as if I had been sent to jail. But I don’t hold any grudge against anybody about that. It taught me something. It taught me how to study. It taught me how to concentrate, how to do my homework. I’ve always loved to read, but in order to be able to read during study period I had to first show my completed homework, for example.

We were divided into small groups for our studies, and the proctor would carefully look over my work. We took Italian, math, plane and solid geometry, Greek, Latin, history, geography, and a foreign language, with no choice or electives. Practically no sports, except for an occasional intra-group soccer game in the large school playground. Incidentally, the boarding school is still there and functional, but was undergoing repairs when the EERI reconnaissance team, mentioned earlier, went by in December 1980.

**Reitherman:** Did your classical education include using your Greek and Latin in the study of other subjects outside your language classes, such as history?

**Morelli:** Yes, very much so. Latin especially was used in all suitable subjects to imbue the student with a thorough understanding of Roman society and culture: the vast influence that it acquired, starting from a collection of huts on the banks of the Tiber River in the 8th century B.C.; uniting what is now Italy; disposing of its major rival Carthage in three costly wars. And in a millennium—give or take a few years—uniting the then-known western world into a cohesive and smooth-working (unfortunately not democratic) political unity that survived another half a millennium, and the influence of which is still felt on our daily language and life.

### **High School in Rome: Obtaining a Liceo Classico Diploma**

**Morelli:** For my three years of high school I went to live with a maternal uncle in Rome, and attended what was reputed to be the best high school in town, named after Torquato Tasso.<sup>1</sup> It still exists on Via Sicilia, a few blocks from the well-known Villa Borghese and Via Veneto, near the U.S. Embassy. I had done my junior high work in a provincial town and furthermore completed the five grades in four calendar years (by sacrificing a summer vacation and taking the required entire battery

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1 Torquato Tasso (1544-1595) is regarded by many as the greatest of the late Renaissance Italian poets.

of tests in September). Consequently, I found that going to a large high school in Rome was a rather difficult adjustment for me. My first year was not a very happy one. I struggled to get good grades, which depressed me, because up to that time I had always done very well. The curriculum by then had expanded to include physics, chemistry, biology, and trigonometry, while the foreign language was dropped. There were no electives, no sports, and a very heavy homework load. Fortunately, I got over the academic challenge as well as my personal dissatisfaction, finishing high school with a very good grade average in spite of the tough competition, passing the final gate to the university level.

**Reitherman:** What were some of the favorite classics you read in the original?

**Morelli:** I never felt as comfortable with Greek as I did with Latin but nonetheless enjoyed the battle sequences in the *Iliad*, and, of course, the descriptions of the looks that launched the Greek thousand-ships armada and—just quoting now—of “the woman with the ample breasts” (Helen, of course). We read passages from the other great authors, but I had my problems with Aristophanes. I do not recall any tragedies. Reading Latin, on the other hand, was pure joy—after I got over the grammar and syntax rules in the first couple of years in junior high. I admired the harmony in the sentences—almost musical—and the parsimony of expression. So much so that I later took Latin as an elective in my freshman year at Harvard under the great Latinist E. K. Rand, who taught his last course in my freshman year. Virgil was my favorite author, by far. His recounted of the vicissitudes of Aeneas

and the unhappy romance with Queen Dido, which I later rediscovered in Berlioz’s opera *Les Troyens*.

In Italy, a high school diploma means a great deal more than it does in this country. At that time (1940), and to this day, it is the severe and decisive selection point in life. There’s a very stiff exam, both oral and in writing in most subjects, at the end of each high school year, but at the end of the third year it’s especially severe. If you do not pass the exams in June, you can retake the tests in September, but in not more than two courses, and if you fail in September, you have to take the whole year over, and you’re allowed to do that only once. I am not sure about today, but in my days, if you did not have a diploma from a classico liceo, you simply could not go to a university. Going to school at night or otherwise improving yourself after that selection point was impossible. I think this is unfair, but who am I to judge it? When I had an opportunity to compare myself with students in this country when I returned here, on the other hand, I found I had a broader education, a more classically grounded education, which to some people means nothing, but meant a lot to me and to my parents. It made me grow intellectually much faster than I would have otherwise, though in the same breath I have to say that my social graces left much to be desired in those days, and there may be traces of that even today.

**Reitherman:** Tell me about what Rome was like in the 1930s.

**Morelli:** I went to live in Rome to go to high school, and I came to love it. In those days, it was a quiet, elegant city—a far cry from

what it was in 1980 when I could hardly recognize some monuments for the parked cars that obscured them. A walk among the ruins of the Forum brought to life the many scenes and personages I had heard so much about in class. The National Library was also a quiet refuge, as well as a source of knowledge. Saint Peter's Square was overwhelming, regardless of how many times I went, while the Vatican Museum—I am ashamed to admit—had little attraction, because I came to appreciate the visual arts only later in life. It was somewhat similar with my taste in music, enjoying ballet, chamber, and symphonic music only later on.

On a less elevated level, I remember the pomp and circumstance (and the three days of vacation) that accompanied Hitler's visit to Rome in 1938 that sealed the Axis Pact and thereby the fate of Italy in World War II. There were many spectacles. I remember seeing the two dictators unexpectedly drive by in an open car on Via Nazionale (a main arterial), with no visible escort. (Imagine that today!) Very vivid images still come to mind in connection with a true extravaganza: the staging of the second act of *Aida* (the triumphal scene) at the Baths of Caracalla, on a stage the size of a football field, with costumes and animals to match. I heard they had emptied the Rome Zoo to appropriately populate the stage.

In my frequent bike rides, I also saw Mussolini several times ride his favorite horse in the riding ring that he had within the confines of Villa Torlonia, his private residence. My uncle's condo—Italy had them at least half a century before the District of Columbia did—was not too far away from that villa, and I used to ride in the vicinity because there was

hardly any traffic there. And, of course, I heard him wax poetically about the greatness of the new Roman Empire several times in Piazza Venezia.

My recollections as youngster living in a totalitarian regime are not as sharp as they would have been, I am sure, had I been older and lived first in the U.S. Nonetheless, I remember the sense of loss when two of my classmates suddenly went absent from school, and we could get no news about them. They were Jews. But only much later did the horror of their fate dawn on me.

On major holidays we stayed home, and out of trouble. That way my uncle—a nominal member of the Fascist party so that he could keep his hard-earned high position at the Corte dei Conti—could avoid wearing the hated black shirt, otherwise compulsory on such occasions. There is no exact equivalent of the Corte dei Conti in our federal structure. As best I can determine, it has elements of the Office of Management and Budget and the Comptroller of the Currency, and functions as well as a court of last instance in adjudicating some disputes between citizens and the state. I also recall that he very often listened to the BBC broadcasts, after asking me to leave the room, so that I would not inadvertently blabber about subjects that the Italian press did not cover. And I was told to stay away from the area where it was reported that political prisoners were taken—and I believe it was Palazzo Farnese—the same where the second act of Puccini's *Tosca* is set, but I'm not quite sure. In Grottaminarda, on the other hand, Fascism was hardly noticeable, as far as I can recall. Mussolini was not as successful in extending

his power over the whole country as Hitler apparently was in Germany. Looking back, Fascism appears to have been mostly an urban phenomenon.

## Returning to the U.S. as World War II Begins

**Morelli:** By the time I was nearing the end of my high school years in 1940, Italy was about to enter World War II. War was raging on the Western Front, and it was obvious that Italy was going to enter on the Axis side with Germany. My dad, back in the United States, kept badgering my mother and me to return. He was sure that Italy would be engulfed in the war—he had been saying that for several years. I can remember his rather frantic letters—yes, letters, not phone calls. We had a phone in Rome, but the only phone in Grottaminarda in those days was in the post office—a wall model that had to be cranked up by hand—and available only for emergencies during regular office hours. (Now I get cell phone calls from family in Italy frequently.)

Finally, in the spring of 1940, fearing to be trapped in Italy during the war, my mother left for the U.S., while I remained behind to finish my last year of high school. As a precaution in those tense days, I always carried my American passport when I left the apartment, even for school. I left Italy in May of 1940, with a fresh diploma from a classico liceo, on a ship (the *Manhattan*) that waited a whole week in the port of Genova for a large number of refugees that were coming from all over Europe. It was the last large ship that left Italy before Italy entered the war. It carried about five times as many passengers as it was supposed to. I shared

a first-class cabin with four other men. I slept on a cot. Cots had been placed everywhere, including the swimming pool. The trip was uneventful, except for a brief delay at Gibraltar, where the British Navy was enforcing an embargo as part of protecting the Mediterranean from Germany, as best I can recall. We nearly ran out of water before we got to New York.

If I had stayed, the Italy government could have forced me into military service, making me lose my U.S. citizenship. I, along with the others on board, all had reasons for feeling fortunate we made it on that ship. As we were entering the port of New York, we heard that Italy had entered the war.

**Reitherman:** Were you able to be up on deck? Do you remember what it was like to sail into the New York harbor after being away from the U.S. from the third grade through high school?

**Morelli:** Yes, I remember very distinctly. Everyone was happy. It was just like the scenes of ships of immigrants entering a U.S. port in the movies. I had mixed emotions, not about entering the U.S.—I was coming back to my country—but because I was leaving behind so many close relatives, especially on my mother's side, my surrogate family for all those years in Italy.



Figure 1. Schematic map of Italy showing selected locations discussed by Morelli.

# Starting at Harvard, War Approaches

*From ever since I can remember, my parents had always said I would go to college. No question about that, no discussion about whether I would. It was just a given fact.*

**Morelli:** The summer of 1940 should have been a happy one for me, having just graduated from high school, but it was not. I didn't know anybody in the Boston area except family and some relatives. I started looking around for a university to enter, and that was a bitter experience. I came with a precious piece of paper, a diploma from an Italian liceo, with excellent grades, and there wasn't a single college in the Boston area that would even look at it. They didn't recognize it. I felt deeply rejected.

From ever since I can remember, my parents had always said I would go to college. No question about that, no discussion about whether I would. It was just a given fact. That's why sometimes I don't know why young American men and women today have so much angst about whether to go to college if they have the opportunity. It just doesn't make sense to me. My dad was not rich, but he was determined I would go to college, and he very often mentioned Harvard. Well, Harvard, just like all the other colleges, just

laughed at my liceo diploma in the summer of 1940.

The next best thing was to go to a prep school. On advice of a nephew who was a pediatrician and also taught at the Harvard Medical School, my dad selected the New Preparatory School, on Brattle Street in Cambridge, occupying one of the three Longfellow homes. It was very expensive for a day school (\$600 in 1940 dollars), as compared to \$400 for a whole year (two semesters) at Harvard in those days.

**Reitherman:** When I was there in the late 60s, early seventies, Harvard's tuition had climbed to \$2,000, but it hadn't begun the rapid climb toward and above \$20,000 or more as is commonly the case in U.S. higher education today.

**Morelli:** The cost of my prep school was quite a stretch for my parents, but they somehow managed. It was an excellent school, taught me English again, and prepared me for the College Board exams. I passed Latin and history with highest honors, just passed English, and Harvard then accepted me. (The Italian diploma got me something in this country: I had to pass only three, rather than four, College Board subjects)

**Reitherman:** That was when James Bryant Conant was president of Harvard, when he injected equality into the admissions and scholarship process by basing it heavily on standardized tests, the SAT set of tests, rather than social class or having an alumni parent.

## Entering Harvard College a Few Months Before Pearl Harbor

**Morelli:** I started in the autumn of 1941. By that time, the war was raging all over Europe and was about to begin in the Far East as well, with the Pearl Harbor attack being only a few months away. I lived at home, which at that time was in Arlington, next to Medford, thus reducing the cost of my college education. Looking back, I now realize that I lost much of what going to college really means, aside from a good education, but it was the only possible way to attend. For example, except for an occasional invitation, I missed eating in the Freshman Dining Room (in coat and tie) or in the dining rooms of the various Houses—some of them quite elegant in those days. As a commuter by street car, I generally ate a sandwich at Dudley Hall, the commuter students center at that time.

**Reitherman:** When I was a freshman there in 1967, the old rule had just changed, and you could eat in the Freshman Dining Room without the coat and tie. Many things changed in U.S. society around that time. How did you spend your time at home when you weren't studying?

**Morelli:** The Morellis did not lack life's necessities, but an extra treat often consisted of no more than a newly-released 78 rpm opera record that we all enjoyed, played on a new "talking machine," or "Victrola."

The discipline of the boarding school stood me in good stead. I had no difficulty adjusting to college-level work—so much that I got all As in my first semester. That got me a prize, the "Detur Award" (a book), and also enabled me

to apply for and obtain a much appreciated (by my parents) scholarship. I had some difficulty deciding my field of concentration, however. I wavered between Romance languages, history, and political science (or “government” as it was called in those days).

**Reitherman:** Do you remember any of your professors in particular?

**Morelli:** Some stand out vividly in my memory. There was a government professor named Arthur Holcomb. He had lots of anecdotes about his experiences in government, so his lectures were always interesting, although at times far off the subject at hand. There was also a professor whom I liked a lot. He gave courses in constitutional law, a subject that fascinates me to this day, and I have to confess that I can still see his face, but have forgotten his name. I also continued to take Latin, as I have already said. Professor Rand had an uncanny ability to use classical expressions and words and apply them to everyday modern events. For example, every Monday morning, he gave a little summary of the previous Saturday’s football game. I also loved history, and pursued it well beyond the minimum requirements, but decided against it as a field of concentration.

The instructor who undoubtedly had the greatest single influence on my choice of concentration in government was not a professor but a recent Ph.D. Dr. Ranney, leader of my section, where a lot of the teaching and learning work actually occurred. His influence was gentle, but steady—hardly noticeable at the time, but effective I now see in retrospect. Without it, I believe I would have gone into languages, and probably an entirely different direction. After the war, I felt real pain

in learning that he had succumbed to a bad heart condition, which had kept him out of the service.

**Reitherman:** You must have been one of the few to appreciate all the jokes in the Latin oration that is included in every year’s graduation ceremony.

**Morelli:** Not really. I had trouble understanding what was being said, because of the accent that most Americans have when they speak a foreign language, aggravated by the fact that I am used to the so-called “Church Latin” way of pronouncing certain consonants and words, the famous “Veni, vidi, vici,” where the “v” is pronounced “vee,” and not “we,” for example.

**Reitherman:** What about memories of some of the wonderful libraries?

**Morelli:** Oh yes, the huge Widener Library in particular.

**Reitherman:** It wasn’t till well after our time that the beautiful oak card catalogue cabinets were replaced by computers.

**Morelli:** Everything was done by hand in those days.

**Reitherman:** Did you attend any Boston Red Sox games?

**Morelli:** No, I am afraid not. I was invited to a game, soon after my arrival from Italy by a distant relative, but it was a Braves game—yes, the Braves were in Boston those days. Baseball was and to this day remains somewhat of a mystery to me. My extracurricular activities were limited to an occasional Harvard football game with a date, paid for by being an

usher at other games. I had to study to keep up my grades and the scholarship. Further, we did not have a car, so my social activities were rather constrained. Radcliffe “girls”—no offense meant, but that is how they were called—were easier to date, but intellectually challenging. It was the same in the few upper-class and graduate courses they were allowed to take with the

Harvard men, the process of making the place fully coeducational just beginning to evolve then during Conant’s presidency. The Radcliffe students were formidable competitors. Otherwise, the two institutions were entirely separate in faculties, curricula, facilities, and campuses.

# In the Army During World War II

*There was a need for somebody who knew something about the French political system that was just emerging from the war. That's when I started what I call my Parisian career.*

**Morelli:** As I've explained, World War II was looming, so I enrolled in what was called the enlisted reserves, a program whereby a college student would be deferred until the end of the semester, when he was then drafted. In my case, I was called up as I was in my first semester of my junior year in the fall of 1942 and entered the military in March of 1943.

So in 1943 I was in the army and went through basic training in Virginia, at Camp Lee, in the Quartermaster Corps. It was rather difficult. I have never been very athletic—not a surprise to those who know me. I struggled through it. At the end of basic training, the cooks and bakers courses were full at that time, I flunked the mechanics aptitude test miserably—I could not put together those gadgets that I had just taken apart—so I was sent to Clerks School. There I learned to type, supposedly by the touch system, but actually I passed the various tests by using the two-finger Morelli system, which I still use. We all wrote the papers we had to prepare

for our courses in college by hand, believe it or not!

Then, probably because I had expressed an interest in the intelligence branch of the military, I applied for and got into the just-launched Army Specialized Training Program. The program sent soldiers back to school to develop expertise in a particular region's language and culture.

### Studying French in the Army Specialized Training Program

**Morelli:** Since I knew Italian already, I requested French, and for some reason I got what I asked and was sent in the summer of 1943 to a small college in the country, in the Hudson Valley region of New York, Bard College. It's a delightful, small, liberal arts college.

The courses in the Specialized Training Program there consisted of a total immersion in the language, the culture, the history—both military and political—of the foreign country, France in my case. We were only allowed to speak French, from the moment we got up to when we went to bed. I had taken French as a foreign language in my freshman year at Harvard, and that was a help, but I also had a lot of Latin, and my Italian, and all of that background made it rather easy for me to acquire some level of fluency in French in just a few months. So now, in the early winter of 1943, I was trilingual. At that point, a handful of us were picked out and interviewed by a visiting group of army colonels, for reasons we did not know. But in a matter of weeks some of us were told we were leaving Bard for another army assignment.

### Military Intelligence Training

**Morelli:** I ended up at the Military Intelligence Training Center in Camp Ritchie in the Maryland mountains, not very far from where we're sitting here in Washington D.C. We went through thirteen weeks of very intensive training, which among other things, sharpened our French, taught us how to be translators, and how to handle refugees and gather from them tactical military intelligence while we were directing them to where they could get the proper sort of assistance. We were trained to talk to different classes, ages, sexes, and so on, but not interrogate them. It was very well-conducted, and it was the first time I was impressed by anything in the army, to tell you the truth. For example, they had actors and actresses who played the parts of refugees, and we would talk to them in a simulated bivouac—those mountains in Maryland can get awfully cold. It really prepared me well for what I eventually did when I got to Europe.

I finished the course just before D-Day occurred on June 6, 1944. I remember hearing of the news of the invasion early in the morning from someone in an adjacent bunk in the barracks soon after the Normandy invasion started: "They've landed—they've landed," he said. There was great excitement.

A few weeks later, on a hot summer afternoon that I will never forget, I was told to immediately report to camp headquarters, and by that evening I was in a staff car headed for Baltimore to catch a train to go to an embarkation point near Boston. A typical military intelligence team consisted of a lieutenant, a master sergeant, and two staff sergeants. A master sergeant on one of the French military

intelligence teams at the embarkation point had suddenly gotten ill, and I had been selected to take his spot. I was made a master sergeant, I prepared all my papers, wrote out my will, received cash for the trip—things that normally take days and days, all in a matter of very few hours. The army can move when it wants to. I caught the train out of Baltimore that night. (Soldiers mostly traveled on slow night trains.) When I reported to the embarkation point near Boston, I could see the hills where my parents lived in Arlington, but from the moment you were told you were shipping out you were not supposed to tell anybody, so I could not contact them.

### Paris Soon After Its Liberation

**Morelli:** On the Fourth of July, 1944, we sailed out of Boston Harbor, on a rickety old boat where people slept and ate in turn, in shifts. We joined up with a huge convoy, and during the crossing we had several submarine scares, but we didn't suffer any attack. They were all either false alarms or maybe our destroyers took care of them. After eight to ten days of an incredibly crowded and boring shipboard life we reached England, and ended up in Glasgow. From there we traveled in a small convoy of two jeeps per team to a small English village, Broadway. It was a beautiful quaint village, with some houses still with thatched roofs. Unfortunately, there must have been hundreds of GIs for each original inhabitant, but they were most tolerant and friendly in spite of the Yankee "invasion." The town is located near Stratford-Upon-Avon, though regretfully, I never succeeded in getting there while we were stationed in Broadway. We were away from the front, but every night we could

see bombers overhead, returning to a nearby base from bombing runs on the continent.

Broadway was one of the many areas where troops were temporarily based, awaiting combat assignments. (The GIs called them "repple depples," a contraction of "replacement depots.") The teams were waiting to be assigned to a combat unit. My team just missed being assigned to General Patton's army, which would have been rather exciting—that is the army that swept through from the Normandy landings, to Paris, and on to the Rhine and Berlin, if I remember correctly.

About the twentieth of August, without having been assigned to a combat unit, the army finally decided just to send us over to the continent anyhow. We traveled to Southampton, where we spent the night in our jeeps, but were offered washing facilities by the ever-friendly locals. We boarded another rickety old ship the next day; crossed the English Channel, and landed on one of the combat beaches—Omaha, I believe—but it was quiet at that point, in spite of the still very evident signs of the horror that D-Day must have been. We got our jeeps off the landing barge and started our trip through the Normandy countryside, with signs of destruction everywhere, following a road that still bore stark, and still very evident, testimony to the effectiveness of the Allied air interdiction campaign on road communications.

We stayed one night in a small town that turned out to be a regular stop for some convoys traveling from Normandy toward the east. The locals were some of the friendliest strangers I have ever met to this day. Some of them had arrangements with the army that

permitted us to sleep in one of their bedrooms—with mine furnished with a bed that was the most comfortable since I had left home. The owner outdid himself by waking me up at dawn, not with an espresso, which I would have killed for, but with a glass full of Calvados, the local equivalent of gin, and was visibly disappointed that I refused. We started toward Paris the next morning. The main road had been swept of mines and was still very bumpy, but the traffic was not particularly heavy, so we made good time.

Paris had been liberated on August 25th, and this was a few days afterwards. The road took us through the suburb of St. Cloud, which sits high over the Seine Basin. Suddenly the road turned and there in all of its glory, bathed in a warm August sun, stood Paris. The emotions of joy and exhilaration were just overwhelming and indelibly imprinted in my mind. It was a real high, as we would put it these days. I will leave it at that, since I lack the ability to express my reactions more adequately.

Once in the city, the French-speaking teams were led to Avenue Kleber, a few blocks from the Arc de Triomphe, and to the Majestic Hotel for our first warm meal in several days. There, in the splendor of the main, mirrored dining room, uniformed waiters served us Spam, with a tasty French tomato sauce, but Spam nonetheless. The Majestic Hotel was one of the largest in pre-war Paris. The Germans had taken it over and converted it into an office building. A two-foot-thick concrete wall protected the main entrance against French partisan attacks—a 1940s anti-terrorist measure. We were at first billeted in one of the apartment buildings opposite the hotel. I remember

well the roar caused by one of the few V-1 missiles that hit Paris, which landed not too far away at the Auteil race track one early morning in late fall.

## Morelli's Parisian Career

**Morelli:** We were the first French-speaking army contingent that arrived in Paris after the French-speaking members of the Third Army had moved on. We were in great demand. The teams were given various assignments. Mine was assigned to the headquarters of the Seine Base Command, the unit that was in support of the fighting forces, which by that time were rapidly advancing toward the north of France, and specifically to the G-2 Section. Our offices were in the Place de l'Opera, in the building that housed the hated Kommandatura—the headquarters of the German occupation forces in Paris—and which we took over. I remember my tasks as being rather mundane: setting up the initial Section files, with the French Police screening the few remaining German sympathizers; vetting prospective French employees seeking work with the Americans. At one time, my team was assigned to provide temporary security for SHAEF, the Supreme Headquarters of the Allied Expeditionary Forces (Eisenhower's staff) that was moving to the continent from England.

Eventually, there arose a need for somebody who knew something about the French political system that was just emerging from the war. That's when I started what I call my Parisian career. The French Resistance—or *Forces Francaises de l'Intérieur* (FFI)—was transforming itself into an effective instrument of government, whereas during the war it was,

in modern terms, a terrorist movement. De Gaulle had come over from England and had formed a provisional government, this time on French soil, rather than in England. So I essentially became the person who prepared the periodic situation for the Paris headquarters of the U.S. Army report on what was happening politically and with the economy. The American Embassy was not yet open, so it was a significant source of information on France.

It was an exceedingly interesting assignment for a young man of twenty-two who hadn't yet finished college, and who was interested in politics and economics. I don't know exactly how I got that job—I sort of grew into it. Until I came back to the States, every month I wrote a report that summarized how France was reawakening as a nation. My first effort in that direction was my working with a group that prepared a report recommending strongly that the U.S. provide emergency financial aid to France to help it recover. It was approved (for a few million dollars, as I recall), the first post-war financial aid the U.S. provided to France, long before the Marshall Plan was even conceived.

Most of the sources of information that I used were open publications—newspapers, periodicals, and books. Slowly, I also developed a number of personal contacts, including one or two members of Parliament, and even a very small net of secret sources—that is all for details. Suffice it to say, the G-2 Section as a whole was very well informed of political activities and events, although much less so of detailed economic conditions.

One very fascinating experience was seeing Paris come back to life. No electricity in one

area one night, two nights later the lights were on in the whole *arrondissement* (section). The Metro slowly reached farther and farther out into the suburbs. The sporadic shooting from German sympathizers stopped very early on, thank goodness. They had no support to sustain them. (There was, however, an attempt on de Gaulle's life at the Notre Dame Cathedral just a few days before we arrived in Paris.) In those days, there was genuine gratitude towards the Americans for having liberated France from the long and hated German occupation. Food for a long time continued to be very scarce, except for apples and oysters—the oyster beds having escaped untouched by the invasion. And that is where I learned to love them—on the half shell, with a drop of lemon.

My career in Paris gave me a very valuable base for a lot of things that I did later on. It was also a very comfortable life for a GI. We wore civilian clothes most of the time. When we wore our officer uniforms, they had no insignia of ranks, just "U.S." on the lapels for identification, and we carried a bilingual pass that allowed us to go anywhere we wanted. I even had a modest expense account and a car, a 1939 Olds, with the gearshift on the steering column, no less. It had reputedly belonged to the daredevil head of what we would now call the German Special Forces, which, among other exploits, tried to liberate Mussolini from the Italian partisans at one point. His name was something like "Skorzyny," phonetically spelled.

The army had taught me French to the point where when I put on civilian clothes, nobody knew I was an American. My French had a slight southern accent, which actually was a

perfect cover and fit well with the fact that there are a lot of Morellis in Marseille in southern France. I just had a faint trace. In those days it was almost, but not quite, Parisian, but, alas, not any more.

As far as living quarters were concerned, from across the street from the Majestic we soon moved to near the opera, and I think it was the Hotel de l'Opera that burned very recently. Then we went to the Hotel Victor Hugo, on the avenue of the same name, in the 16th Arrondissement, which is in the ritzy part of Paris. In between, my team went to Versailles and to Saint-Maur-des-Fosses, just a few miles southwest of Paris, for short tours of duty.

**Reitherman:** Were you able to see the sights in Paris?

**Morelli:** Oh yes, there was ample time for that. I worked as hard as anybody else, but there was free time, and seldom did we have any evening assignments. The Germans allowed much of the artistic activities in France to go on during the war, of course not as freely as was the case after the liberation. The Germans controlled authors and composers, there was censorship, but the opera stayed open, the theaters were open. Among the activities that the U.S. Army tried to encourage was resurgence of artistic activities.

**Reitherman:** What kind of an impression did grand Parisian architecture have on you? With your interest in opera, what about the Paris Opera House, the one designed by Charles Garnier with its grand staircase, not the new one that could be mistaken for a department store.

**Morelli:** The first time I went to the Paris Opera House, it was an incomparable experience. The first ballet I ever saw was there. I remember *Jeux d'Enfants*, based on Bizet's music. That started to enlarge my musical horizons from opera. And it is a love that continues to this day. My wife, Dottie Madison, and I have the ballet series at the Kennedy Center and catch ballets everywhere we go.

The cabarets and dance halls in Paris and entertainment establishments like those you find in Place Pigalle were open, and probably never closed during the war. There's an interesting exhibit of Toulouse Lautrec now at the National Gallery here in Washington, with scenes of Montmartre and Place Pigalle, depicting places I had visited, as well as events that had occurred only thirty or forty years before I was there in the 1940s. The exhibit was one with which I connected emotionally, like no other.

**Reitherman:** What do you recall of the first time you went to Notre Dame Cathedral?

**Morelli:** I was overwhelmed by Notre Dame. I went there while a mass was being said. "Overwhelmed" is the adjective that comes most to mind, although from the history of art course that I had in high school, I expected soaring arches and a sense of reaching for the heavens. And it wasn't only Notre Dame. The same with La Madeleine, Sacré-Coeur, and St. Augustin, the church where Camille Saint-Saens had been the organist not many years earlier. Like Rome, interesting churches are everywhere. The Louvre opened gradually. I recall going there the first time, and seeing hall after hall empty, because the French had done a very good job of evacuating

their treasures and hiding them from the Germans.

Until I left Paris, my career remained the same, reporting on the political and economic conditions in France. In the spring of 1946, I had enough “points” to be discharged from the army. By that time, Harvard had accepted me back, but the semester was well under way, so I accepted the offer of the G-2 Section to stay on for a while. At the same time I married a Parisian who had done work with the French Resistance by securing rations tickets and other documents for a number of persons that were being hidden by the Resistance from the Germans—Jews, escaped Allied airmen,

POWs, and political persons for the most part. So, during the last six months in Paris I worked as a civilian employee, doing exactly the same thing, but at about double the pay (\$240 per month versus a Master Sergeant’s pay salary of about \$120).

It’s an experience I’ll treasure the rest of my life. I could have at one point gone on to a two-week officer-training course after which I would have become a second lieutenant, but I said, “what for?” I never had ambitions to become a career officer. My Parisian career ended when I returned to the United States in September of 1946 to go back to Harvard.



# Back in the United States for Graduate School and a New Career

*So, having moved to Washington, D.C., showing up for my first day of work as promised, I was informed I was out of a job.*

**Morelli:** My return trip to the United States in 1946 on a troop ship was uneventful. We landed in New York and I took the first train I could get to Boston to see my parents for the first time in three and a half years. Then, I soon got down to the task of thinking about my future.

## **Finishing the Undergraduate Degree at Harvard**

**Morelli:** I discovered that I had enough credits from my undergraduate studies that if I took five courses in the upcoming fall semester, instead of the usual course load of four courses, I could get my AB in January, 1947. That meant that I didn't have time to write a thesis for an honors degree, although eligible to do so.

As I neared graduation, I considered several options. One was to continue my studies and get another degree. I could live virtually free with my parents, and the generous provisions of the GI bill would even provide for things like paper and books as well as a \$90 per month stipend. That wasn't much, but it meant spending money for a young couple. At that time, educational institutions were hit by a tsunami wave of returning veterans, and competition was very keen to get into graduate school. I took the Graduate Record Examination, GRE, and kept my grades up. I applied to business school and much to my amazement I got in, so that was one option. But somehow the work that I had done in Paris and the traveling I had done made me consider seriously going into the State Department's Foreign Service.

## On to Graduate School

**Morelli:** In the meantime, I heard about a new course of studies that bridged several Harvard departments, set up by a special committee of the Graduate School of Arts and Sciences, the Committee on International and Regional Studies. It allowed the student to take a number of courses in different social science departments. This sounds trite today, but in those days, it was something new. Professor Donald McKay chaired the committee and had worked in the OSS, the Office of Strategic Services, predecessor of the CIA, in World War II. My background in intelligence work gave us some common ground, and we established a good rapport in my first interview with him. Another member of the committee was Professor Edwin O. Reischauer, the senior Reischauer.

**Reitherman:** The Reischauer who was the expert on Japan?

**Morelli:** Right.

**Reitherman:** But who is the junior Reischauer?

**Morelli:** Robert, his son, who was the director of the Congressional Budget Office for half a dozen years in the 1990s.

I applied for admission to this new International and Regional Studies Program, with a focus on Western Europe, and the final step before being accepted was an interview with the dean of the graduate school of arts and sciences, Professor Wald, an expert on international law. I prepared carefully for the interview—why did I want to be in this program? Why was I qualified? And on, and on.

I vividly remember being admitted to his office. He got up and we shook hands. He had me sit down, and I was filled with uneasy anticipation of the volley of questions he would fire at me. Then he said, "Congratulations, welcome to graduate school." That was that.

I applied for a fellowship and received a modest one, \$200 a semester. I also discovered a part-time job without spending too much time away from books. I was a proctor for examinations, and the pay—for those days—was pretty good: a dollar an hour. And if you were a senior proctor in charge of a large examination you got a dollar and a half. I could study in Widener Library, go to nearby University Hall to pick up the exam and the blue books, supervise the exam, deliver the blue books back to University Hall, and return to my studies in Widener.

In my case, in that post-World War II aftermath, we were a young couple, living with my parents, with the GI Bill, the fellowship, and the proctoring income needed to make ends meet. I worked hard, feeling the pressure to get out and begin my career. I took a heavy course load, went to summer school, and finished in eighteen months rather than the usual two years for the master's degree. In summer school, we went to class Monday through Saturday. And in those days, you wore a coat and tie to class, even in the hot humid summertime. The master's degree, in addition to the two-year set of coursework, required writing a master's thesis, passing a language proficiency exam, and then passing a two-hour oral exam.

I remember fondly working on my master's thesis with Dr. Schlesinger.

**Reitherman:** Another father/son clarification: that must have been Arthur Schlesinger, Senior? The history professor who began at Harvard in the 1920s?

**Morelli:** Yes, not the Arthur Schlesinger, Jr., the other Schlesinger historian, who was active in the John F. Kennedy administration in the 1960s and was one of his chief speechwriters, including probably the principal author of Kennedy's famous inaugural speech. The topic of my master's thesis sounds obsolete today. It dealt with the French coal industry between the two world wars. Of course there was great enmity between France and Germany, two countries that had been fighting each other since 1870. Following World War I, the mines in France were running out of coal, which existed in abundance just across the border in Germany. It was a significant influence in international relations in that era—not only for

the two countries, but also for the rest of continental Europe. With my French, I was able to access original sources. Working on that thesis was a pleasant experience, but I turned out a very dull paper indeed, nothing to brag about.

**Reitherman:** It doesn't sound obsolete at all. It seems parallel with the influence of petroleum on today's international relations.

**Morelli:** Yes, just another form of energy. Another memorable experience in getting my M.A. was the two-hour oral exam. The questions could and did span across political science, economics, and sociology. I was one of the first three graduates in that new degree program. Frankly, I don't think the committee that set up the program had yet developed a clear idea as to what the requirements were, or should be. The program eventually ended up getting absorbed in the Kennedy School of Government when that was later established.

Those two hours in the oral examination were sheer torture for me. There was one final question about the Marshall Plan, which as of then, 1948, was being established by Dean Acheson, Secretary of State—perhaps it actually should have been called the Acheson Plan. (His son lives just above us in this building here in Washington D.C., by the way.) Western European countries were rebuilding from the war with the aid of the Marshall Plan. The U.S. had initially extended the offer to the Soviet Union to join the program, but the USSR declined. The question that was posed to me was: should the Soviet Union have accepted the offer from the U.S. to join the Marshall Plan?

I said, yes, they should have joined, looking at it from the point of view of the Soviets.

The committee members were stunned. They looked at each other as if I were incompetent. It was not the answer they expected. They recovered from their surprise, and I recovered from mine, and I went on to explain that if the Soviet Union had wanted to wreck the Marshall Plan, thereby weakening the European nations not already under their control, they could have done nothing more effective than to have taken a role in the Marshall Plan. My reasoning was that because with the ill will and mistrust between the U.S. and the USSR that had developed by then, only a few short years after being allies in the war, no one in Congress would have voted to fund a Marshall Plan that had the Soviets in it. This was all off the top of my head and I had never dealt with this topic before. Anyhow, after I waited outside for fifteen interminable minutes, they shook hands with me and said I had passed. What a relief!

## Looking for a Job

**Morelli:** As I mentioned, I had considered the Foreign Service career path early on. When I was finishing graduate school, I discovered to my dismay that one could not take the Foreign Service exam, not even apply, if one's spouse was not an American citizen. My French wife had not yet been in the U.S. long enough to be a citizen.

So I went to Washington, D.C. to explore employment with other government agencies, with hopes of working in a related field until I could later apply for the Foreign Service. I interviewed with the Intelligence and Reconnaissance bureau at the Department of State. At the Central Intelligence Agency, I had to fill out a fifteen-page security questionnaire, and

write a "think piece" on the topic of what the implications on U.S. policy would be if Charles de Gaulle became a strong source of central authority in France. When they reviewed my questionnaire, however, and discovered that I had spent more years abroad than in the U.S. at that time, they probably expunged all records of their having even interviewed me because I probably seemed of dubious loyalty. There was also some interest from the army intelligence (G-2) in the new graduates of the international program I had completed. I received and accepted an offer to work in the branch that prepared people to go abroad as military attachés. I was going to be sent to Rome as an analyst in the Military Attaché's Office.

On the basis of that job offer, in June of 1948 my wife and I picked up our few belongings and left Massachusetts for Washington D.C. I was to report for processing June 30 and begin work July 1. (In those days, the federal government fiscal year began July 1, instead of October 1, as it is now.) Just before I took the oath of office on June 30, however, I was told there was a glitch in the paperwork and to come back the next morning.

I went back the next morning and unceremoniously was told that the army was very sorry, but in the new fiscal year's budget there was no funding for my position. At that time, during the administration of Harry Truman, the military had not been shrinking fast enough after the end of World War II. The army was going through what was called the "Royall Flush," a mandate to drastically cut staffing, led by the Secretary of the Army Kenneth Royall.

So, having moved to Washington, D.C., showing up for my first day of work as promised, I

was informed I was out of a job. We had paid one month's rent, but after that—then what?

## With the Air Force as a Civilian Employee

**Morelli:** I spent the next two weeks intensively searching for a job under what I remember as a particularly hot Washington sun, going from office to office in countless buildings. One of the interviews that I had was with the Air Targets Division of the U.S. Air Force Intelligence office. Within days I received an offer, which I accepted in a heartbeat.

That group's assignment was an outgrowth of the way the U.S. had planned and conducted its strategic bombing campaigns, both against Japan and Germany. They were "strategic" in that they targeted the economic infrastructure that provided the enemy with the wherewithal needed to conduct warfare, as distinct from "tactical" bombing, which was directed toward military forces engaged in actual combat. It's hard to believe that this concept, common today, became defined and put into execution only about seventy-five years ago.

**Reitherman:** George Housner tells in his EERI oral history how he was in the Operations Analysis Section of the Air Force in North Africa and Italy in World War II, analyzing the effectiveness of different Allied bombing methods. He applied his engineering and mathematical talents to such problems as the alignment of a group of bombers passing over a bridge that produced the highest probability of a hit on the bridge, and whether defensive aerial cables held up by balloons would

slice through a bomber's wing or whether the wing would cut the cable.<sup>2</sup>

**Morelli:** Without knowing it, we probably used some of his computations in preparing the weapons requirements portion of our targeting lists. In any case, after the war, there was a scholarly study of the strategic bombing of Germany by the Institute of Defense Analysis, a well-respected think tank of those days. The overall conclusion of the study was that the bombing had had a major role in hastening the victory of the Allies by crippling the ability of German industry to produce the machinery to run the war.

By the mid-1940s, this experience of World War II led to the development of strategic bombing planning and the creation of the Air Targets Division. The major function of this division was to produce what was called the "Target Annex" to the Joint Operations Plan—namely the facilities that would be hit and the order in which they would be hit in the event the U.S. and the Soviet Union went to war. It has been more than thirty years, so I can describe generally what we did, but in those days, you can imagine how secret our work was—even our families did not know what we were doing, except for what they could deduce from the name of the division.

I was charged with looking at how the Soviet industry worked and how to target it. The tools we had then were incredibly primitive. No

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2 *Connections: The EERI Oral History Series:* George W. Housner. Stanley Scott, Interviewer. Earthquake Engineering Research Institute, Oakland, California, 1997.

doubt the person who would do this work today would go to his or her computer, press a few keys, and be able to see precise air photos or satellite images of just about everything in the world, correlated with all sorts of economic and other data gathered by a variety of other means. In the late 1940s, however, our best data were primarily World War II aerial photos the Germans had taken as far as they had advanced eastward, about the line of the Volga River. We extracted information from such a variety of sources, including old postcards and other correspondence, from design information from American companies that had worked on construction projects in the Soviet Union before the war, and from accounts of returning German prisoners of war.

It was detective work, true intelligence work, but primitive by current standards. Very fascinating and challenging because of that very reason.

When I started as a junior member of the staff, I was assigned to analyze the components that were assembled into complete industrial systems. In some cases, we would start with a component as basic as the mineral itself that was used in some finished product like airplanes or tanks or nuclear weapons. I learned the tools of the trade, how to assemble disparate facts to form an overall picture.

After a target was identified, it was analyzed by a physical vulnerability branch that computed aiming point, and the type and number of conventional high-explosive bombs needed to cause damage. In a steel plant, for example, if the big gantry cranes were put out of commission, you couldn't move things around to make steel even if the rest of the facility was undamaged. On the other hand, aircraft assembly plants typically had lots of small equipment distributed over the

site and were harder to put out of commission by just disabling a key component or two. A nuclear power plant was even harder to disable because of the heavy protection placed around the reactor core. However, the advent of first atomic and then nuclear weapons with their tremendous destructive power heavily impacted this vulnerability analysis, but not the selection of the targets themselves.

I moved up the ranks fairly fast, starting with being responsible for uranium ore production in the Soviet Union and its satellites, then moved to industrial components, which included the ubiquitous ball- and roller-bearings—over 50 percent of the whole production being concentrated in one plant at the outskirts of Moscow. For a short while, I was responsible for the category of iron and steel production, and then moved on to direct the whole industrial production target system.

At age thirty-three, I became one of the youngest GS-14s in the civil system. There were only about 2,500 of them for the whole U.S. in those days and only about one thousand GS-15s, which was then the top pay level

So, at an early age, I found myself approaching limits on advancement. That made me think about seeking another career. But when you are in intelligence, it is difficult to build on that experience for finding another line of work. First of all, I couldn't even talk about what my work had been for the last half dozen years with the Air Force. In 1956 and 1957, I looked around and had a few interviews. I ended up with two offers, one with the missile division of Boeing in Seattle, which was just starting up in earnest. If that offer had been San Francisco, I might have gone, but I wasn't interested

in moving to Seattle. The second offer, which I accepted, was with the Glenn Martin Company, located on the outskirts of Baltimore.

## Working for the Glenn Martin Company

**Reitherman:** Was that the complete city built from scratch in World War II, to provide housing for workers, factories, and an airport where the freshly manufactured B-26 bombers were flown off for delivery?

**Morelli:** Yes, the town, Middle River, Maryland is still there, but the production facilities have since been closed and recycled. There were 24,000 employees, about 4,000 of whom were engineers when I joined the company. The major work at that time was sea-planes, something the Glenn Martin Company had specialized in way back prior to the First World War. By 1958, missiles had come onto the scene.

**Reitherman:** There were quite a few famous individual aircraft designers who founded firms in the early years of the twentieth century that later entered the jet and spacecraft eras, with various mergers and acquisitions along the way in response to economic fortunes.<sup>3</sup>

**Morelli:** One possibility for Martin to keep up with the times was to put a big investment into making the Middle River facilities competitive for that new line of work, the kind of investment we discovered later the corporation was not ready to make.

We had a sizable contract for the Gemini Project, the second manned space project, which followed *Mercury* and preceded the *Apollo* spaceflights to the moon, and that provided needed income for a while. We bid on and won a large contract for the lunar landing module in the Apollo Project, but, as it came out later, for political reasons that decision was overturned and the contract given to Grumman.

As the Glenn Martin Company struggled to develop new product lines, I moved into strategic marketing and strategic planning, for example, for the space program.

By the mid-1960s, it was quite obvious that the corporation was allowing that plant to die. In retrospect, the company had some legitimate concerns over pumping large amounts of money into a somewhat obsolete set of facilities. Requests for funds to make us competitive were turned down on many occasions. My career there was not proceeding as I had

3 In 1961 the Glenn L. Martin Company merged with American-Marietta to form Martin-Marietta. In 1995 Lockheed, founded in 1912 by the Loughhead brothers (the name later changing to Lockheed) acquired Martin-Marietta to establish Lockheed-Martin. The Martin name is also associated with several other major airplane firms, going back to the Wright brothers. In the early years of the Martin Company, Glenn Martin (1886-1955) hired and developed the

talents of several men who were later to establish their own major aircraft nameplates—William Boeing (1881-1956), Donald Douglas (1892-1991), Lawrence Bell (1894-1956), and James McDonnell (1899-1980)—as well as James Kindelberger (1895-1962) who became the key executive of North American Aviation. In the 1920s, Martin merged his initial company with the company of Wilbur (1867-1912) and Orville Wright (1871-1948), creating the Wright-Martin Aircraft Company.

planned and hoped for. In retrospect, it was the beginning of the end for the historic old Martin firm. Eventually, Lockheed took over the entire company. I started looking for employment elsewhere, and left in November 1968, by which time total employment at the Middle River site was down to 2,600—about a tenth of what it was when I started there—with only about 200 engineers left.

### Joining a Startup Company

**Morelli:** Somebody I knew in the electronics division at the Glenn Martin Company, Harry Letau, had a strong entrepreneurial spirit, and he and a partner had founded a company here in the Washington DC area, in Virginia, that we would today call a dot.com, a venture capitalist-funded start-up. The company had a management sciences consulting component, a training component, and the third component was a television production facility—a strange combination. The business model was one of synergism. The TV studio was used by the training division for its clients, also produced internal training videos, and produced commercials. The company was called Logos, Ltd. I became the head of the Management Sciences division and had about thirty-five employees to manage.

**Reitherman:** Did “management sciences” mean consulting services to improve a company’s management practices?

**Morelli:** That’s it—exactly it! We included in our services actually providing support to augment what they did with their own staffs. Today this is common, but it was a new idea then. Most of our clients were government agencies. We had offices in government buildings, the way firms under contract to the government often operate today, often on multi-year contracts for one particular agency. So I left Baltimore, which I had never been too fond of anyway. (Coincidentally, about this time, the marriage with my first wife was coming to an end.)

Logos won a large two-year contract to support the naval operations of nuclear submarines. The company did well in the beginning, based mostly on the revenue from this contract. I had stock options and bright prospects. The video production facility, however, could not carry its own weight. It had a high overhead that was a big drag on the rest of the company when the demand for video services did not materialize in the quantity envisioned and hoped for. We lost out in the bidding for another big management services contract with the federal government, and then suddenly the firm was in financial difficulties—the business model had failed. It was just a question of how long it would be before the company would fold up. Our venture capitalist angels had disappeared. Once again, I was faced with the necessity of a career change.

# Beginning A Career In Emergency Management

*By chance, I ended up with a two-week temporary employee job with the Office of Emergency Preparedness. That job was extended two weeks, then another two weeks, then a month, then three months—to make a long story short, my two-week temporary job ended up being a thirty-two-year career in emergency management and related activities.*

**Morelli:** At Logos, we had a small contract with a little-known part of the U.S. government, the Office of Emergency Preparedness.<sup>4</sup>

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4 The “family tree” of U.S. federal agencies related to disasters over the years is complex, but in essence, the Office of Emergency Preparedness was the same agency, with name changes, of the predecessor Office of Civil and Defense Mobilization and the Office of Emergency Planning. The Office of Emergency Planning was dissolved in 1973, with dispersal of emergency management roles among federal agencies, such as the Federal Disaster Assistance Administration of the Department of Housing and Urban Development, and the General Services Administration. That decentralization was reversed in 1979, with the formation of the Federal Emergency Management Agency, centralizing various federal disaster

This was a small group in the Executive Office of the President, which had been given new importance by President Kennedy after the 1962 Cuban Missile Crisis. The original emphasis was on planning for defense from nuclear attack, but it had gradually expanded in scope to include natural hazards. The Logos contract with the Office of Emergency Preparedness was managed by a gentleman named James Lewis. Jim had come over from the Corps of Engineers to head up response and recovery activities at OEP sometime before my days. He was a legend in his own time, acting as the guardian of the taxpayers' money in disaster recovery and a terror to local officials trying to get federal funds for reconstruction after a disaster. He was very strict, but very fair. He was a man of great integrity and great devotion to his work. A civil servant in the best sense of the word—although at times I wished he would bend a bit and give me funds to do mitigation work.

## Joining the Office of Emergency Preparedness

**Morelli:** That slight contact is how I entered the field of emergency management and later of mitigation, as it came to be called. By

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programs in one independent agency (i.e., it was not part of a department), whose director reported to the president. The 2002 establishment of the Department of Homeland Security put the responsibility for natural hazards and terrorism threats within one central department, subsuming FEMA and its natural disaster portfolio of programs within the larger security-oriented element of DHS. See Henry Hogue and Keith Bea, *Federal Emergency Management and Homeland Security Organization: Historical Developments and Legislative Options*. Congressional Research Service, April 19, 2006.

chance, I ended up with a two-week temporary job with the Office of Emergency Preparedness. That job was extended two weeks, then another two weeks, then a month, then three months—to make a long story short, my two-week temporary job ended up being a thirty-two-year career in emergency management and related activities. I retired in January, 2003 from FEMA, the Federal Emergency Management Agency, OEP's twice-removed successor agency.

**TABLE 1. SELECTED FEDERAL EMERGENCY MANAGEMENT AGENCIES AND THEIR YEARS OF ESTABLISHMENT**

Office of Emergency Management, 1940
Federal Civil Defense Administration, 1950
Office of Civil and Defense Mobilization, 1958
Office of Emergency Planning, 1961
Office of Emergency Preparedness, 1968
Defense Civil Preparedness Agency, 1972 (in DOD until folded into FEMA in 1979)
Federal Disaster Assistance Administration, 1973
Federal Emergency Management Agency, 1979
Department of Homeland Security, created by Department of Homeland Security Act of 2002 (FEMA as part of), 2002

**Morelli:** The Office of Emergency Preparedness was charged by Public Law 91-606, the Disaster Relief Act of 1970, with preparing a study investigating improvements in how the country could reduce losses caused by natural hazards.

Shortly before I started working at OEP in September of 1971, an interagency working group had been formed to write a report—called for by Congress—on natural hazards.<sup>5</sup> Robert Schnabel, the Director of the Disaster Study Group of the Office of Emergency Preparedness, a former Air Force colonel, was the head of that working group. As far as I know, Bob Schnabel was the first person in emergency management in the federal government to really advocate comprehensive mitigation in advance of, as well as planning for response after, disasters. As you know, that became the key subject of my subsequent career with FEMA—hazard mitigation with respect to earthquakes.

I want to digress for a moment to pay a tribute to Bob. He, more than anybody else, is responsible for introducing me to the world of hazard mitigation. He had extensive contacts with influential persons in industry such as Karl Steinbrugge and Henry Degenkolb; Gilbert White, Frank Press, Howard Kunreuther, and Gene Haas in academia; Charles Fritz at the National Academy; Charles Thiel at NSF; Richard Wright at what is now NIST; Ted Algermissen, Walter Hays, and Robert Hamilton at USGS; and Robert Simpson at the NOAA Hurricane Center, to mention only a few. Bob introduced me to all of them, gave me an invaluable opportunity to meet them, work with them, and learn from them. Without him and the doors he opened for me, my second federal career might well have been entirely different—and much less rewarding.

I was editing drafts of material from various members of Bob's group. Then for some reason, I was assigned the job of writing the chapter on earthquakes. Why I was given that subject I don't know. The February 9, 1971 San Fernando earthquake was a disaster that had occurred only a few months earlier. I did some quick research on that earthquake and other earthquakes and put together what I thought was an acceptable chapter.

**Reitherman:** I read the copy you loaned me before coming here today, and if I may inject a quick book review here, I think that it, and your chapter on earthquakes, stand up very well even today, with the passage of thirty-five years. It has the basic science and engineering facts straight and is quite comprehensive, even with mention of the ecological impacts some earthquakes have had, such as the 1959 Montana, the 1964 Alaska, and the 1970 Peru events. The whole report is a classic. What was the process, the technology, of putting such a book together at that time?

**Morelli:** The process was quite straightforward. Bob recruited each member of the group of experts from a number of federal agencies. Each was assigned a chapter or portions thereof, then went away to do the necessary research, including asking for help from experts both in and out of government, and then submitted the first draft, often handwritten. Two other individuals and I edited these first drafts, asked the originators for rewrites or additions, if necessary, and coordinated them. A pool of typists produced new drafts, which Bob Schnabel then went over, often repeating the cycle until he was satisfied. At that point, the final version that was eventually sent to the printer was produced.

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5 Office of Emergency Preparedness, *Disaster Preparedness: Report to the Congress*. January 1972.

In addition to the review work I touched upon already, I was assigned to author two chapters—one on earthquakes and the other was on land use and construction. In those days, it took an average fifteen years for research results to work their way into building codes and practices. Today, we've reduced that to something like five years or fewer. That's one area where we have made some progress. Again, I had to be a quick study, and produced a draft that was considerably augmented and modified by the several experts that reviewed it. Incidentally, the list of individuals and organizations that helped in this process covers two printed pages of acknowledgments in the final report

**Reitherman:** Your “temporary employment” with OEP was quite significant in shaping your career. Not only did that experience recruit you into disaster management, it presaged the forte you would develop at FEMA: the two chapters you authored turned out to define the central theme of your subsequent career with FEMA—developing and implementing codes, standards, and guidelines for earthquake-resistant construction.

**Morelli:** Quite by accident, but you are correct.

The original version of the Disaster Preparedness report had a rough estimate of the cost of adopting the mitigation recommendations. That added to its usefulness as a policy tool. Since it was a report to the Congress, however, it was routinely routed to the Office of Management and Budget for review before submittal to the Congress. OMB required the removal of all the cost figures, and that's the way it was published. OMB has been the graveyard of many reports of various kinds over the

years, all for the same reason. Our OEP report was published and submitted in January 1972, but you will note that there is nothing at all in it about the costs of mitigation.

**Reitherman:** For example, there was a recommendation to set up a national clearinghouse on disaster research and related information. That originally had a line item cost figure included with the text?

**Morelli:** Yes, either item by item or grouped in categories.

I'm convinced that the 1972 report helped change the climate in the emergency management field. It was really the first compendium that covered natural hazards and comprehensive ways of dealing with them, and featured mitigation with policy recommendations—not response and recovery as was usually the case.

**Reitherman:** In this interview session [April 2006] in your home in Washington, we're only two weeks away from the commemoration of the 1906 San Francisco earthquake. In addition to specific effects of that earthquake on developments in earthquake engineering, it had a diffuse but significant effect on the field—a rising tide that has elevated the whole field. Using your metaphor, the climate in the earthquake field changed for the better because of 1906, even if the day-to-day weather, or the short-term particulars, aren't directly affected by it.

**Morelli:** You have articulated my view of the long-term effect of that OEP report. In any case, from the personal point of view, it gave me the opportunity to work with a fine group of individuals, and it defined the long-term goals I sought in my subsequent career.

My next assignment was to work on a bill to improve federal response and recovery, based on the inadequacies that became apparent from Hurricane Camille in 1969.<sup>6</sup> Does this sound like a story similar to Hurricane Katrina in 2005?

At that point, the Disaster Relief Act of 1970 and a 1971 amendment were the latest pieces of legislation on disaster relief and recovery. We, as part of another study group headed by Bob Schnabel, worked for eight months, coming up with an almost endless combination of measures to help victims, but it was a frustrating experience. We failed to find a combination of disaster mitigation and relief provisions acceptable to the Nixon administration. All our suggestions were too liberal for their taste. At the end, the Office of Management and Budget (OMB), in the person of Frank Carlucci, OMB director at the time and co-chair

of the study group, essentially dictated the assistance provisions that would be acceptable. On that basis, like good soldiers, we put together a proposed new disaster assistance bill and an accompanying report that were submitted to the Congress in May 1973.

The future historian exploring the development of disaster mitigation will find hidden in the bowels of that bill, in Section 801, a real gem. Section 801 stipulates that hazards present in areas where grants or loans are to be used must be mitigated by local governments through measures “including safe land-use and construction practices,” as a condition for receiving disaster assistance. That was the first time that mitigation was tied by statute to disaster assistance—so not all our efforts were in vain.

Eventually, the next major piece of disaster legislation, the Disaster Relief Act of 1974, was put together by the Congress itself, more specifically by the staff of the disaster subcommittee of the Senate Public Works Committee. It bore some resemblance to some of the more liberal combinations of provisions in our OEP report. The phraseology of the original Section 801 was picked up and is to be found today under a different section number in the latest version of the Stafford Act that governs disaster assistance.

**Reitherman:** Do I have the overall historical pattern of emergency management legislation in the U.S. correct? Ad hoc disaster relief laws were passed early on, disaster by disaster. The *Disaster Preparedness: Report to the Congress* book says over 100 bills were passed for various disasters between 1803 and 1950. I think 1950 was chosen as the end of that timeframe

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6 Hurricane Camille, a Saffir-Simpson 5 storm when it made landfall (Hurricane Katrina was a Saffir-Simpson 3), remains the most intense hurricane known to strike in the U.S: wind speeds reached 200 mph. Wind pressure varies as the square of the velocity, and thus 200 mph winds are four times as intense as winds that are “only” 100 mph. Storm surge reached 25 feet. Hurricane Camille made landfall in Mississippi on the night of August 17, 1969 in a relatively lightly developed region, which limited the losses to \$1.5 billion in 1969 dollars, though it was the costliest tropical hurricane in the U.S. up to that time (\$9 billion in year 2012 dollars). There were 256 deaths. (Eric Blake, Edward Rappaport, Jerry Jarrell, and Christopher Landsea, “The Deadliest, Costliest, and Most Intense United States Tropical Cyclones. From 1851 to 2004.” NOAA Technical Memorandum NWS TPC-4, National Hurricane Center, August 2005.)

because that is when the Disaster Relief Act of 1950 set up the basic system of presidentially-declared disasters and associated relief we have today. So disaster relief came first, as a federal program, even if piecemeal. Was it only in the timeframe you're discussing, after the 1964 Alaska and 1971 San Fernando earthquakes, and after Hurricane Camille in 1969, that mitigation became a part of the federal effort?

**Morelli:** Yes, that's basically accurate, but the expansion from a relief-only scope, to relief-plus-mitigation, was slow. Thanks for your complimentary review of the 1972, but its effects were not major and immediate, unfortunately. A major reason was the untimely illness that struck Bob Schnabel a few years later, and his premature death. And we had to wait a decade and a half to get a mitigation champion of his stature and ability in the federal service. I am referring, of course, to Clinton appointee James Lee Witt and his associate directors for mitigation, first Richard Moore and then Michael Armstrong, two gentlemen that I will talk about later.

**Reitherman:** Today, we use the word "mitigation" as in "disaster mitigation" so routinely that we don't think about it. But it is a term that hasn't always been used in our field. To those who are not in the field, I've noted that it takes a while for them to figure out that when people in the earthquake field talk about earthquake hazard mitigation, they might mean adding bolts or braces in a building. Do you recall when "mitigation" first entered the field?

**Morelli:** It's in the 1972 report to the Congress. One of the four basic parts of the report is entitled "Disaster Mitigation." It already had

entered the disaster lexicon by that time. I'm not sure how far back it goes, however.

## Federal Disaster Assistance Administration

**Morelli:** The Office of Emergency Preparedness was disbanded in 1973, as of June 30 of that year, by the President's Reorganization Plan No. 1 of 1973, and the fragments of its responsibilities and staff distributed among various federal agencies. I was moved to the Federal Disaster Assistance Administration, FDAA, in the Department of Housing and Urban Development. HUD was set up in 1965 during the Johnson Administration. FDAA inherited the disaster declaration and relief functions of OEP in one piece, basically unchanged.

TABLE 2. U.S. PRESIDENTS  
DURING MORELLI'S CAREER

HARRY S. TRUMAN	1945–1953
DWIGHT D. EISENHOWER	1953–1961
JOHN F. KENNEDY	1961–1963
LYNDON B. JOHNSON	1963–1969
RICHARD M. NIXON	1969–1974
GERALD R. FORD	1974–1977
JAMES E. CARTER	1977–1981
RONALD REAGAN	1981–1989
GEORGE H. BUSH	1989–1993
WILLIAM J. CLINTON	1993–2001
GEORGE W. BUSH	2001–2008

OEP was cut up in a strange way. The official reason was that it had become too operational, and the Executive Office of the President, where it resided, was not supposed to handle those functions, as compared to the various federal departments. There may have been other more subtle reasons.

**Reitherman:** In retrospect, do you think that the Office of Emergency Preparedness was one of the most successful ways the federal government structured its disaster programs?

**Morelli:** Yes, it was one successful way to arrange the bureaucracy. I don't know what's going to happen to the federal disaster assistance function now, after the 2005 Hurricane Katrina experience, but I believe that its position in the bureaucracy needs to be very close to the president. Disaster assistance needs the power and the prestige of the president to work effectively. OEP provided that close connection. And regardless of where that function is placed, there also has to be a close and trusted relationship between the president and whoever heads up the disaster agency. It's just a personal observation, and time may prove it wrong. I soon moved away from disaster relief in my career into disaster mitigation, but whenever I looked over at the disaster relief function, I observed the importance of that personal relationship. It didn't matter too much for the run-of-the-mill disasters, but it was and still is essential for the "big ones."

Looking back, there followed a period when I don't think I made much of a contribution. There was no funding for any pre-disaster work. I remember pleading with Jim Lewis—who controlled just about all the FDAA disaster-related funds—for small sums like \$25,000,

very often in vain, to do some studies on mitigation.

What I had succeeded in doing by that time, however, thanks mostly to the efforts of Charles (Chuck) Thiel who was at NSF, was to meet people at NOAA, USGS, NSF, and other agencies who were active with regard to natural hazards mitigation. I remember reviewing or participating in some studies that others funded, but my FDAA day-to-day work was only tangential to hazard mitigation. Here are a few of those efforts from that era. [Morelli places them on the coffee table in his home.]

**Reitherman:** I see that in the preface to *Aftermath: Communities After Natural Disasters*<sup>7</sup> they acknowledge Gilbert White as their inspiration.

**Morelli:** This was just after the time that Gilbert White had moved from the University of Chicago to the University of Colorado at Boulder, around 1970. He set up the Natural Hazards Research and Applications Information Center in Boulder in 1976.

**Reitherman:** I'm no expert on disaster recovery research, but I don't recognize the authors' names as people who stayed in the disaster field.

**Morelli:** They didn't. Their research funding stream ran out, so they moved into different areas.

**Reitherman:** This *Aftermath* book seems to take a longitudinal slice through the disaster

7 Friesema, H. Paul, James Caporaso, Gerald Goldstein, Robert Lineberry, Richard McLeary, *Aftermath: Communities After Natural Disasters*. Sage Publications, 1979.

subject, looking at the long-term aspects of re-building. This other book, *After the Clean-up: Long-Range Effects of Natural Disasters*, was a follow-up to *Aftermath*, also seems to look at the disaster event as something that lasts for decades. That long-term perspective seems to fit in well with the thinking of Gilbert White, the way the geographer, the ecologist, the climatologist, looks at things. When did you first meet White?

**Morelli:** When he and Gene Haas were working on the first assessment of natural hazards research. I had a chance to go to the event in 1974 that started the series of the annual natural hazards conferences the Boulder Center puts on now.

**Reitherman:** Wow, the first one! That's historic. I'm familiar with the formula for the workshop in Boulder as of around the early 1980s, when it included a barbeque on Gilbert White's hilltop property near Boulder, to the present day, but what was the first gathering like?

**Morelli:** It was in 1974 and was held in Estes Park, not in Boulder. It was a rustic affair, held at a camp that I think belonged to the Boy Scouts or the Girl Scouts. The later conferences you're familiar with were quite different, more of a smorgasbord of lots of people and topics to sample from. This Estes Park event was a structured, intense workshop—we really worked. It was in direct support of the preparation of the first assessment and was attended by the elite of the disaster research community at that time. We were given assignments as to which topics to cover, and our input was aimed at producing results by the end of the event—input for the first assessment. There were less than a hundred people in attendance. I kept the

original, thick, three-ring binder with agenda, assignments, notes that I took, and other mementos of that seminal conference. When I retired from FEMA I donated it to the Boulder Center, to which I have also donated my other papers, all now part of the Center library.

**Reitherman:** Here's another of the reports you collected from the mid-1970s: *Assessment of Research on Natural Hazards*.<sup>8</sup> Another classic. Here's a loaded question for you. If you look at the framework and findings of this work by White and Haas from thirty years ago, does it make some of our current assessments and strategies seem a little redundant, as if maybe we should go back over what was already discovered long ago?

**Morelli:** That volume is the product of the first assessment to which I have referred. In answer to your question, you can easily find both in this volume and in the Preparedness Report to the Congress recommendations for actions that are still valid decades later. But let's be fair and point out that many recommendations, better seismic and storm surge maps, better construction practices against major hazards, to mention just a few, have been implemented, and progress continues. There was a second assessment study of natural hazard research and applications done more recently.<sup>9</sup> Frankly, I don't believe it had the impact that the original one did. The first one was a significant contribution

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8 Gilbert White and Eugene Haas, *Assessment of Research on Natural Hazards*. Cambridge: MIT, 1975.

9 Dennis Mileti, *Disasters By Design*. Washington, DC: National Academies Press, 1999.

toward hazard mitigation that had a noticeable impact on the research that was conducted after its publication. It had a big impact, indeed.

Without detracting anything from the merits of the first assessment, I want to point out that circumstances were favorable to the translation of recommendations into actual research studies at that time. I am referring primarily to the existence in those days at NSF of the RANN Program, Research Applied to National Needs Program. It allowed NSF to conduct research targeted specifically to different facets of a broad topic, such as earthquake mitigation. It was focused and pertinent. The fact that the person in charge of RANN, or closely connected to it, was somebody with a broad vision, Charles Thiel, was also of great help. In the late 70s or early 80s, unfortunately, RANN was abolished for reasons never clear to me. The result has been a diffused and fragmented research program at NSF in support of natural hazard mitigation ever since—quite a controversial statement, I am sure, but one that is correct in my judgment.

**Reitherman:** The 1975 assessment study has a recommendation here that is almost verbatim the one in the 1972 OEP *Disaster Preparedness* report, to set up a national clearinghouse of information on natural hazards to make the research more accessible and useful. There are some great individual collections I've used—the Disaster Research Center's collection when it was at Ohio State University, the Natural Hazards Center's library in Boulder, the EERC earthquake library run by UC Berkeley, for example—but it's a fragmented resource. I

recall when I was young and naïve and asked where NSF had its library where all the final reports on the research it has funded over the years were located.

**Morelli:** There is none, to this day. Some simple recommendations from the past still make sense, like that one. And I hear that the idea has recently been revived once more. Hopefully, this time around, something concrete will happen.

Speaking of research, let me mention a related effort that I completed in 1975, with Schnabel's support, although it did not have the impact that I had hoped for. As a result of the White-Haas assessment that had just been published, there was at that time a great deal of interest in research related to natural disasters. Yet nobody knew specifically and in detail what research had been completed. To fill this void that came to my attention, I scraped together some funds, even got the Smithsonian and a temporary employee to help me. The result was a telephone-book-size compendium of multi-hazard disaster-related research projects completed since 1970 that we could identify from a large variety of sources, *Directory of Disaster-Related Technology—A to Z*. Despite its encyclopedic scope and physical size, however, it attracted little attention, was seldom quoted in the literature, and had minimal impact in practical terms. Obviously, not one of my stellar achievements.<sup>10</sup>

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10 *Directory of Disaster-Related Technology—A to Z*. U.S. Government Printing Office, Superintendent of Documents, Washington, D.C., 1975

## Earthquake Prediction

**Reitherman:** Here are a few of your reports from your collection in the mid-70s on the earthquake prediction subject: *Earthquake Prediction and Public Policy*,<sup>11</sup> *Earthquake Prediction and Hazard Mitigation Options for USGS and NSF Programs*,<sup>12</sup> and *Earthquake Prediction Response and Options for Public Policy*.<sup>13</sup>

**Morelli:** I was able to review or participate in the formulation of some of that work. It was an era when there was great excitement over the possibility of earthquake prediction. At that time, the Soviets had developed a real earthquake prediction capability, so we thought. It was something about the difference in two kinds of waves and the speed at which they traveled.

**Reitherman:** I think they were working on the theory that shortly before an earthquake the state of strain in the rock and associated micro-cracking differently affected the velocities of P and S seismic waves.

**Morelli:** The interest in earthquake prediction spilled over into enhanced interest in earthquake research in general. By this time, somehow or another I had succeeded in getting some funds, and FDAA sponsored the work of a National Academy of Sciences panel, resulting in the *Earthquake Prediction and Public Policy*

book. There was quite a stir at the time over earthquake prediction, and I was glad that I had some small involvement with that hot topic.

**Reitherman:** I see from the front matter that Ralph Turner of UCLA chaired the panel.

**Morelli:** Turner stayed in the earthquake field for a few years and then, unfortunately, drifted away.

**Reitherman:** But his PhD student, Joanne Nigg, ended up a “keeper” for the disaster research community, and later became a president of EERI. I see Bill Anderson was on the panel and at that time was a young professor at Arizona State University, not yet at NSF. E.L. Quarantelli was also on the panel, along with Clarence Allen.

**Morelli:** And Robert Simpson, of the University of Virginia—of the Saffir-Simpson Hurricane Scale.

**Reitherman:** I’ve forgotten: is Simpson the one who developed the index of water effects and Saffir the wind effects, or vice-versa?

**Morelli:** Simpson was the meteorologist, who then was head of the National Hurricane Center, who calibrated the storm surge and flooding. Herbert Saffir is the civil engineer wind expert.

**Reitherman:** I see that on the NAS staff for the panel was Charles Fritz, the early social science researcher on disasters originally from the University of Chicago. E. L. Quarantelli worked for Fritz there back in the 1950s.

And, you’re listed as the liaison representative for FDAA to the panel and were then the Program Officer for the Preparedness Division of

11 *Earthquake Prediction and Public Policy*. National Academies Press, Washington D.C., 1975.

12 *Earthquake Prediction and Hazard Mitigation Options for USGS and NSF Programs*. USGS and NSF, September 15, 1976.

13 *Earthquake Prediction Response and Options for Public Policy*. Dennis Mileti, Janice Hutton, and John Sorensen. Institute of Behavioral Science, University of Colorado, 1981.

FDAA. Bob Schnabel at that time was the chief of that division. The list of people who participated in this study reads like quite a who's who of early influential people in the earthquake field: Charles Thiel, Bob Wallace, Karl Steinbrugge, C. Martin Duke, Gene Haas, Robert Hamilton, Howard Kunreuther.

Then in 1975 there was an apparently successful prediction of the M 7.3 Haicheng earthquake in China—although something of a fluke and didn't lead to a reliable state of the art, but it helped to make the topic newsworthy at the time. USGS even began to make public pronouncements saying that in five or ten years they could accomplish earthquake prediction. I recall being then in graduate school, studying with Karl Steinbrugge. When he read the front page newspaper stories of USGS officials making these claims, he shook his head, saying, "You shouldn't predict that you can predict." We may eventually develop an ability to predict earthquakes, but in retrospect the optimism and boosting of programs in that area in the 1970s didn't pan out.

**Morelli:** Yes, though work on the prediction topic, both policy and earth science aspects, was nonetheless valuable, such as the research on how emergency managers should formulate warnings and how we should anticipate how the public might react. And of course, because even if we have come up with a prediction capability, we still need mitigation: the stirring of the pot in one area helps in another.

**Reitherman:** The original funding for SCEPP, the Southern California Earthquake Preparedness Project, which was set up around 1980, was partly motivated by the supposed precursory phenomenon along the San

Andreas fault called the "Palmdale Bulge." One of the P's in SCEPP was initially for "Prediction." SCEPP changed its name and broadened its focus to Preparedness as the Palmdale Bulge issue receded—but kept its funding.

**Morelli:** Before leaving this topic, let me mention two more related items. First, the possibility of predicting earthquakes had stirred the imagination of the earthquake community all over the world. So much so that in April 1979 UNESCO convened an international symposium in Paris on the subject, attended by some fifty to sixty nations and other international organizations. I attended as part of the U.S. delegation, thanks to Thiel's support and that of the State Department—FDAA having no international role. As a matter of fact, Steinbrugge and I were even supposed to write a paper on earthquake prediction and its economic impacts, with emphasis on the insurance sector, one of Karl's areas of expertise, of course—but when he ran out of time, we had to cancel the paper. The meetings were very interesting and the enthusiasm for this new prediction capability ran very high. Ambitious plans were made for future efforts all over the world and more international symposia, all, alas, to come to naught soon thereafter. Personally, however, Paris in the spring was like going home—second home, of course.

The second related effort was conducted by another committee of the National Academy of Sciences (Committee on Socioeconomic Effects of Earthquake Predictions), which I believe was created in 1976 for the express purpose of developing a research agenda and a plan to effectively handle a credible prediction. Charlie Fritz was the Academy staff assigned

to it. Intended mainly for NSF use, *A Program of Studies on the Socioeconomic Effects of Earthquake Predictions*<sup>14</sup> is an impressive tome produced by the Committee. It covers a carefully constructed conceptual framework for research to help individuals and families, businesses and regional economies, and governments at all levels prepare for and cope with the consequences of a prediction, including legal consequences. All buttressed by five pages of finely printed references. The intensity of prediction fever in Washington at that time was as high as its duration was ephemeral, unfortunately, and was extensively reflected in all the significant earthquake-related documents of those days.

My involvement with some of the earthquake studies I've mentioned was an occasional bright spot, but this part of my career, at FDAA, didn't offer many opportunities for making a real contribution. However, an event was unfolding that would let me try to accomplish something more significant with regard to earthquake hazard mitigation. That event was the establishment of the National Earthquake Hazards Reduction Program in 1977.

## Earthquake Scenario Loss Estimation Studies

**Morelli:** Before moving on to talk about the NEHRP era, one activity that the federal government was involved with in the early 1970s, well ahead of the creation of NEHRP and continued afterwards, was studies of the effects of possible future earthquake on U.S. cities. Is

that important enough to mention here? Like the first two studies of San Francisco<sup>15</sup> and Los Angeles<sup>16</sup> and the later ones on Salt Lake City and Seattle?

**Reitherman:** Definitely. The loss estimation field has continued in importance to this day and is regaining interest right now, but the first of the studies from the group headed by Ted Algermissen and Karl Steinbrugge, with a large group of experts, set the standard. Even today, with HAZUS, the table of contents of a typical loss estimation study is very similar to that of the originals you cite. Methods have changed, but the basic steps remain the same: define earthquakes in terms of shaking and ground failures; overlay on that natural landscape the inventory of buildings and infrastructure; estimate damage, and relate damage to casualties, property losses, outage of key functions, and recovery.

**Morelli:** Those first studies of the early 1970s were done largely on three-inch by five-inch cards and a lot of paper, not computers. By the mid 1980s, federal studies had been done for a dozen U.S. metropolitan areas. It would be interesting to compare the results from those early studies with today's.

14 National Academy of Sciences, Committee on Socioeconomic Effects of Earthquake Predictions. Washington, D.C., National Academy Press, 1978.

15 Algermissen, S. T. et al., *A Study of Earthquake Losses in the San Francisco Bay Area: Data and Analysis*. National Oceanic and Atmospheric Administration, 1972.

16 Algermissen, S. T. et al., *A Study of Earthquake Losses in the Los Angeles California Area: Data and Analysis*. Federal Disaster Assistance Administration, 1973.

**Reitherman:** The recent study by Charlie Kircher<sup>17</sup> for a recurrence of the 1906 earthquake in the San Francisco Bay Area comes up with the figure of 3,400 fatalities for the least favorable time of day. The figure for the 1972 NOAA study was a little over 10,000. The figures are not exactly comparable, because the Kircher study looked at the Bay Area the way

it is today, not as it was in 1972, and the data collection and analysis methods were different. But insofar as one can revisit the same region every decade or so, and compute estimated losses on a consistent basis, there would be a measure of how much risk changes on a per person or per square meter of building area basis. It would seem to be a rational way to “keep score” on how we’re doing in contending with earthquakes.

**Morelli:** An interesting project, but one that may never get a sponsor. Typically, each new study has its own new reasons for existence, its own themes and methods.

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17 Charles Kircher et al., “When the Big One Strikes Again: Estimated Losses Due to a Repeat of the 1906 San Francisco Earthquake,” *Earthquake Spectra*. Vol. 22, S2. Earthquake Engineering Research Institute (EERI), April 2006.



# National Earthquake Hazards Reduction Program

*The establishment of NEHRP was by far the most significant development I have seen in my career in the mitigation of earthquake losses.*

**Morelli:** There had been a great deal of activity, especially since the mid-1970s, on the part of individuals like Karl Steinbrugge to get people interested in dealing with the earthquake problem. Karl had a vision for a structured, comprehensive program, and he stuck with it and eventually saw it become a reality. He had access to people at the highest levels, like Frank Press who was the president's Science Advisor at that time and later moved to the presidency of the National Academy of Sciences. Karl was also close to Senator Alan Cranston (D. California), who had a vital role in both California and national earthquake policy developments. He was also close to Representative George E. Brown, Jr. (D. California), who was a powerful supporter of the program until his untimely death in 1999 and played a key legislative role at the national level in the creation of the NEHRP. There were many other people

who played important parts leading up to the passage of the National Earthquake Hazards Reduction Act in 1977. In my post at FDAA, I was not centrally involved in that work, however, given the negative position that the administration at that time took on the issue, and I do not believe there was any significant role played by any other FDAA person in the evolution of the legislation.

On the outside, however, there was a great deal of ferment that eventually led to the preparation of some significant reports that were completed and circulated at the highest political levels. Those reports materially accelerated the passage of the NEHRP act, principal among which was the Newmark-Steever Report.<sup>18</sup>

## The 1977 National Earthquake Hazards Reduction Act

**Morelli:** The law that was passed in 1977 had half a dozen predecessor bills, which all failed because of opposition from the Nixon and Ford Administrations, whose position was that there were enough laws on the books already. No new, comprehensive law was necessary. I recall being assigned to review these bills as an FDAA employee, and being told that regardless of what my review concluded, the agency's

official position would be that no new laws were needed.

Jimmy Carter was elected in 1976, took office in January of 1977, and he and his advisors had a different viewpoint, which led to the 1977 bill's successful passage.

**Reitherman:** I recall being at an earthquake conference of ABAG, the Association of Bay Area Governments, in October of 1977 in Oakland, when fresh news of the Act's passage was creating a stir in the audience.

**Morelli:** Looks like your memory is accurate; the copy of the law I have here has the date of October 7, 1977; it's P.L., Public Law, 95-124.

**Reitherman:** How does the federal law numbering system work?

**Morelli:** The first number, 95, means it was the 95th session of the U.S. Congress; and it was the 124th bill passed by that Congress.

**Reitherman:** Some have called the law establishing the National Earthquake Hazards Reduction Program (NEHRP) a watershed event: Once developments progressed up and over that ridge, everything flowed down the other side. What is your assessment of the historical importance of that 1977 law?

**Morelli:** The establishment of NEHRP was by far the most significant development I have seen in my career in mitigation of earthquake losses. There's nothing in my mind that compares to it for the impact it has had on the events that followed. Before, whatever was accomplished in this field was accomplished in a somewhat helter-skelter fashion, due mostly to the action of dedicated individuals. After

18 NSF and USGS, *Earthquake Prediction and Hazard Mitigation Options for USGS and NSF Programs*. Washington, DC: U.S. Government Printing Office, 1976. The "Newmark" part of the document's nickname was for Nathan Newmark (1910-1981) of the University of Illinois. The "Steever" was for H. Guyford Steever, who was director of the National Science Foundation 1972-1976 and was the president's science advisor during approximately the same years, 1973-1977, under Gerald Ford.

its passage, it was possible to work on rather cohesive and long-range approaches. It takes decades to bring a hazard mitigation strategy to successful conclusion, and NEHRP provided that long-term cohesiveness, that necessary nurturing environment. A key element that the law also provides is a more or less dependable funding level, a framework for conducting program activities in the four key agencies that are involved, namely FEMA, NSF, USGS, and NIST, although over the years, there have been at times significant perturbations due to a variety of causes.

## NEHRP Legislation

**Reitherman:** It would be worthwhile for you to talk in some depth about how NEHRP came to be, to record some historical aspects that have never made it into print before.

**Morelli:** I am not a lawyer, so I won't attempt a section-by-section analysis of the NEHRP legislation, but rather an overview to relate some details that are not commonly known.

As federal laws go, especially these days, P.L. 95-124 is a rather simple piece of legislation. It has the usual findings, purpose, definitions, objectives. It bows in the direction of all constituents, and recognizes the importance of related topics and priorities, of course. But essentially it tells the president to do the following: set up the NEHRP and designate a department or agency to run it—within thirty days of the enactment of the law, prepare and submit to the Congress an implementation plan—and, within 210 days prepare an annual report. The law concludes with the usual (and useless) authorization levels of funding for the president (\$1 million for the first year) and

NSF and USGS (\$27.5 million each)—useless because it is the appropriations (not authorizations) committees that decide funding levels, of course.

**Reitherman:** Please explain that distinction, between the authorization to spend money, on the one hand, and the appropriation of the funds that can be spent, on the other.

**Morelli:** Very briefly, the authorization is the legislative process by which a program is created for a specified period of time that varies from one program to another, but generally runs two to five years. To prolong this initial life span, a re-authorization is needed. On the other hand, the appropriation is what keeps the program going year after year, after it has been created (authorized). Both authorization and appropriation bills contain funding numbers, but the ones that count for all practical purposes are the dollars in the appropriation. That is what an agency can count on receiving each year to keep going. The level contained in the authorization bill is a statement of the sense of the Congress as to how much funding the program should receive each year during its existence, but is not what the agency will necessarily receive to implement the program. That will depend on the amounts in the appropriations bill. Each kind of bill includes the full panoply of hearings, committee debates and “marking” (finalizing detailed provisions, including the dollar amounts), and action at the subcommittee, committee, and full House and Senate levels. The appropriation process occurs annually, while the authorizing one takes place only when the program's existence needs to be extended.

**Reitherman:** Sounds rather complicated.

**Morelli:** It is, until you get used to it – then you realize it’s even more complicated. What I have given you is only the theory. The practice is nothing but mind-boggling some years. For example, in the late 1980s the NEHRP authorization expired, but we kept going because we had funds that had been appropriated. Or when the Congress does not pass the annual authorization bills and passes instead a “CR” (Continuing Resolution) and then funding levels for the agencies remain level for that particular fiscal year.

Now back to P.L. 95-124. I do not know who drafted the exact bill that eventually became law, or how long the process took. I suspect the Earthquake Office of USGS had a big hand in it, and Frank Press and his OSTP (Office of Science and Technology Policy) staff did also, as did committees of both Houses of the Congress. I do remember going over a draft that seemed close to being final with Robert Hamilton and Rob Wesson, both from USGS, maybe Thiel, and others, in OSTP, and making some final tweakings. Mindful of the chapter in the 1972 Report to the Congress on preparedness on the subject, I inserted wherever I could references to “improved construction practices and building standards.” They all survived, much to my surprise and delight. That is the extent of my contributions to this process that I can recall—meager indeed.

Eighteen months were to pass before the NEHRP was to find a lead agency home within the newly created FEMA, and many more months before it started to accomplish anything of a substantive nature. But let me proceed in chronological sequence.

## Implementation Issues— the Steinbrugge Report

**Morelli:** OSTP was given the responsibility for the program, but I do not know either the nature of the document that did that, nor the date. Then a gap developed and nothing of note seemed to be happening, but behind the scene, Press talked to Karl Steinbrugge and finally convinced him to move temporarily to Washington in the fall-winter of 1978-1979 and take the first step under the Act.

Steinbrugge selected a half dozen individuals from various federal departments, including William Anderson from NSF and myself, and undertook not the task of writing the required Implementation Plan, but rather identifying the very large number of problems (“issues”) that the new program faced and needed to tackle. My role eventually evolved into being not only the author of several issue statements (three-to-five-page short essays), but also an informal chief of staff (to plug holes, review drafts, keep things moving, and that sort of thing).

**Reitherman:** Sounds reminiscent of your experience at OEP working with Bob Schnabel.

**Morelli:** Yes, the activities of the OSTP working group were not unlike those that Schnabel had going when I first came to OEP. In this effort there were preparation of drafts, circulation for review to over 150 individuals from several scores of private and governmental organizations (dutifully acknowledged in the first few pages of the report), re-writing them again and again, then finally getting Steinbrugge to approve them for final typing and

printing. There was an additional mechanism that was used: one-day workshops to gather inputs to supplement the results of the research conducted by the team. I held one such workshop with voluntary organizations representatives that exposed me (unfortunately for all too brief a period of time) to some of the most dedicated and unselfish and gentle individuals that I could ever hope to meet—a moving and lasting experience for me.

**Reitherman:** Maybe you could explain for the reader what kind of organizations these were.

**Morelli:** There were nongovernmental organizations like the Red Cross, Salvation Army, and the Mennonite Disaster Service.

The eventual result of the whole OSTP effort was *Earthquake Hazards Reduction: Issues for an Implementation Plan*,<sup>19</sup> that took thirty-seven specific problems facing the launching of the NEHRP, and for each gave a brief background and discussion of issues, and offered possible solutions. There is also an executive summary that I remember struggling with, together with Steinbrugge, that in a dozen pages tried to capture the essence of the problems.

## Implementation Plan for NEHRP

**Morelli:** Once we had the analysis of the issues in hand, next came the preparation of the actual implementation plan called for by P.L. 94-124. Thiel and I worked mightily

and produced a first draft, Steinbrugge having departed Washington by then to return home to California where he was on the faculty at the University of California at Berkeley and was the head of the earthquake department for the Insurance Services Office. As I recall, we tried to summarize the recommendations of the *Issues* report and make the plan brief and to the point—actionable, as it would be called today. We turned it in to Phil Smith, who was one of two or three persons reporting directly to Press, and was evidently the most active and capable among them, and to whom Press had turned over the day-to-day tasks of creating the NEHRP. The next thing I was told by Thiel was that Smith had produced the required implementation plan and it was being printed. And in fact it was. Nobody ever talked to me about the draft that Thiel and I had prepared.

When I saw the finished product draft,<sup>20</sup> it bore little resemblance to our draft. In retrospect, however, it was a much more complete document than our draft, and contained thoughtful insights into the then-current state of knowledge of earthquakes and their effects, the need for a broad and long-term effort, and the absolute necessity to have the cooperation of a wide spectrum of society and government entities. Even after almost a generation since it was written, it remains upon re-reading amazingly fresh and, in many fundamental aspects, quite topical. It is almost ironic that some of the “priorities for immediate action” identified in that report are still with us as problems,

<sup>19</sup> *Earthquakes Hazards Reduction: Issues for an Implementation Plan*. Executive Office of the President, Office of Science and Technology Policy, Working Group on Earthquake Hazards Reduction, 1978.

<sup>20</sup> Executive Office of the President, *The National Earthquake Hazards Reduction Program*. Washington, D.C. 20500, June 22, 1978.

such as the need for a focus for the nascent program, a lead agency. Maybe that problem has finally been solved with NIST taking over that role as of the re-authorization act in 2004. Other unresolved issues include encouraging the adoption of seismic codes at the local level and estimating the potential risk to loss of lives in federal buildings in case of an earthquake. The last topic is particularly distressing to me because of my heavy involvement in a study of federal buildings, completed in late 1999, which is still languishing in the Department of Homeland Security (DHS) and OMB bureaucracies—but we can talk much more about that later.

The implementation plan is dated June 22, 1978. On that same day, the Directors of OSTP (Frank Press) and of OMB issued a joint memorandum for all heads of departments and agencies and to selected assistants to the president on the White House staff. The joint memo summarized the main points of the implementation plan and officially established the NEHRP, promising to designate a home for it by the end of July, 1978. That was done shortly thereafter, when the NEHRP was placed in a newly formed unit of OSTP, the Earthquake Hazards Reduction Group. The EHRG was staffed with a few “detailees” (employees paid by one agency, but actually working for another, a method often still used today to get temporary groups staffed quickly, in the White House especially). I suppose because of my past association with earthquake work, I was the detailee from FDAA. That is how I became officially associated, so to speak, with the NEHRP. There may have been others from time to time, but the only other detailee that I can remember is Thiel, who came from

NSF and became the *de facto* head of the group (he may have also been the *de jure* leader, I don’t recall).

## Creation of FEMA

**Reitherman:** Since FEMA was being created roughly at the same time that NEHRP was being launched, perhaps you could describe what it was like to see the agency getting built from scratch.

**Morelli:** The EHRG and the NEHRP remained in OSTP until FEMA was officially established by Executive Order 12127 on March 31, 1979, and then they both became part of FEMA. (Agency wags, when in a bad mood, often recalled that FEMA’s first day on the job was April Fools’ Day, so what can you expect?!)

FEMA was cobbled together by placing under one agency four major groups and several splinters, among the latter, the EHRG. The major groups were the Federal Disaster Assistance Administration and the National Flood Insurance Program from the Department of Housing and Urban Development; the U.S. Fire Administration from the Department of Commerce; and the Defense Civil Protection Agency from the Department of Defense. The four groups had little, if any, contact with one another prior to becoming part of FEMA, although one part of the group that came from the Department of Commerce had somehow started to dabble in earthquakes, why or how I know not.

Except for the Fire Administration, whose home was the former St. Joseph College in Emmitsburg, Maryland, all other groups

were eventually moved into one building, on I Street, NW, in downtown D.C., three blocks from the White House. I still remember vividly that my first office there, shared with whom I no longer recall, had no phones for many days. Next door was the newly established FEMA mailroom. When someone needed to get in touch with me, the call went to the mailroom and somebody from there would stick his or her head in my office and I would get up and take the call in the mail room! But at least I got paid regularly, unlike some new FEMA members who missed a pay-day or two—but, of course, eventually caught up.

I had no part that I can recall in the overall organization of FEMA and do not know who did. In any case, after a few months under an Acting Director, FEMA got its first director: John Macy. Macy had a well established reputation as a most capable federal administrator, having spearheaded several major re-engineerings of the federal bureaucracy, including the establishment in the early 1970s of the pay schedule for federal employees that is still in effect at most federal agencies. At FEMA, however, he faced the same intractable difficulty that finally overwhelmed Tom Ridge as the first DHS director (and that challenges CEOs of large companies during mergers and acquisitions): melding the cultures, systems, procedures, personalities, and skills of several groups into a reasonably well integrated and functioning single organization. In my view, Macy never succeeded. Even within the Directorate of Mitigation and Research, one of the three or four major components of the agency to which the earthquake program (and I) were assigned, overlapping problems were rampant.

## Creation of ICSSC and BSSC

**Morelli:** The major obstacle that faced NEHRP in the early years, however, was the lack of program funds to undertake any outside activity to implement the law that created it. Nonetheless, steps were taken at that time to create two organizations that have played, and still play major roles in the program, namely the Interagency Committee on Seismic Safety in Construction, ICSSC, and the Building Seismic Safety Council, BSSC. The former deals with building codes and construction issues within the federal family, so to speak, while the latter is directed at similar topics in the private sector and outside the federal government. Without these two entities, the earthquake program would have achieved only a fraction of what it has accomplished during its almost three decades of life. Credit for the creation of both goes to Thiel alone, who probably had to take evasive actions to maneuver these two entities around the inevitable bureaucratic barriers.

The ICSSC originally had representation from only about fifteen to eighteen agencies, but by the early 1990s it had grown to over thirty. Originally it had a complicated structure, consisting of some ten subcommittees and a coordinating entity, a structure that continued until the late 1980s, when it was streamlined into five subcommittees and an Executive Committee. An additional subcommittee was added in the early 1990s, I believe, to deal with postearthquake reconnaissance. The chair was originally appointed by the EHRG, in the person of Thiel, and then by FEMA, until shortly after Thiel left the agency in the fall of 1982. At that time, FEMA delegated the task to the

Building and Fire Research Laboratory of the Bureau of Standards, now National Institute of Standards and Technology, where it remains to this day.

I do not know what specific steps Thiel took to bring the ICSSC into existence. The relevant documentation was transferred to the BFRL at the time of the delegation and by now may well have been lost or destroyed. My participation in the efforts of the ICSSC started only after Thiel's departure, when I was named the FEMA representative to the full committee and to the Executive Committee, and a member of Subcommittee 2 on Codes and Standards, assignments that I kept until my retirement in 2003.

As for BSSC, again, I had no part in its creation, but I do have a few letters, memos, and the like dealing with its early history that I have consulted recently for these interviews with you. In March 1979, a few weeks before FEMA officially came to life, a Planning Committee representing eight not-for-profit organizations involved in one aspect or another of construction met. The list is: American Society of Civil Engineers, Applied Technology Council, Associated General Contractors of America, American Institute of Architects, Council of American Building Officials, National Conference of States on Building Codes and Standards, National Institute of Building Sciences, and Structural Engineers Association of California. BSSC sent Thiel, as the then ICSSC Chair, an invitation to attend a meeting in St. Louis on April 22-24, 1979. That was the BSSC organizing meeting, although there undoubtedly were many prior informal

get-togethers and negotiations to prepare the ground.

As a result, many actions of far-reaching impact were taken in the course of two and one-half days at this meeting that was attended by sixty-five representatives of fifty-one organizations. First of all, a new entity was created with the intention that it be "... seen as a new type of instrument for bringing about a constructive relationship between [sic] the diverse interests within the building community, including government at all levels and the private sector."<sup>21</sup> The entity was BSSC, but I do not know who selected the name, nor the circumstances of the selection. The meeting also discussed at some length and approved a charter and rules and procedures for BSSC that have survived with only surprisingly few major changes to this day. (Again, I do not know who participated in the effort to prepare drafts of these documents.)

Thus these two pillars of the FEMA segment of the NEHRP—CSSC and BSSC—were built. But I should go back a few years, prior to the creation of NEHRP, to discuss what I would call the third original pillar of what was to become the national earthquake hazards reduction program.

### ATC 3-06

**Morelli:** In 1974, Chuck Thiel was with the National Science Foundation, and at that time NSF had a program called RANN—Research

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21 Letter of invitation to Dr. Charles Thiel from Gene C. Brewer, President of the National Institute of Building Sciences and Chairman, Planning Committee, dated March 19, 1979.

Applied to National Needs.<sup>22</sup> True to its title, RANN sponsored research that was focused on solutions to urgent problems of the day, all the while training future generations of educators.

**Reitherman:** I recall talking with Chuck long after RANN was phased out. He still was a bit angry that it didn't continue—he thought it was one of NSF's best programs.

**Morelli:** I agree wholeheartedly, and the lack of such a program is still a big gap in the NEHRP. Within RANN, Thiel managed to put together a seminal earthquake program, with what I recall was only about \$1 million, and brought in the National Bureau of Standards (NBS) to start an effort that in about three years put together the progenitor of the *NEHRP Recommended Provisions for the Development of Seismic Regulations for New Buildings*, today's FEMA 450 document.

The project participants list, over one hundred of them, reads like a who's who of seismic experts at the time.

**Reitherman:** This was the ATC 3 project?

**Morelli:** Yes. We should talk about it now, because of its importance. The final document was published in early 1978 by NBS and NSF.<sup>23</sup>

22 Under a different name, RANN had its origins in NSF in 1969. By the mid 1970s, RANN received over ten percent of NSF's total budget, but in 1978 it was demoted to be part of a smaller bureau and its previous programs distributed among other NSF branches.

23 ATC, *Tentative Provisions for the Development of Seismic Regulations for Buildings*. NBS Special Publication 510, NSF Publication 78-8, ATC 3-06.

**Reitherman:** It's interesting that by publication date, ATC 3-06 seems to be in the NEHRP era, but actually Thiel was able to get it off the ground in the pre-NEHRP era.

I recall going to the office of the Structural Engineers Association of Northern California in 1977 to get photocopies of final drafts of chapters of it, before the published version was available. If ever a book in our little niche of earthquake engineering had a pre-publication "buzz," ATC 3-06 was it (-06 because reportedly it was the sixth draft of the document that became the final version). It turned out to be a "bestseller" and a venerable piece of earthquake engineering literature.

**Morelli:** The project had an elaborate organizational structure, technical committees plus overall management and editorial coordination staffs. Thiel, as I mentioned, was the original force getting the project moving, and was the guiding hand. Here's the document, and it indicates Charles Culver of NBS was the titular head of the effort.

The organization of the document is recognizably similar to that of the NEHRP *Provisions*, even today. The first edition of the *Provisions* was in 1985, followed by editions at three-year intervals. The document also included material that helped lead to new efforts with regard to such topics as existing buildings and postearthquake safety inspection, which are beyond the scope of the *Provisions*.

**Reitherman:** Generations with regard to the ATC 3/NEHRP *Provisions* lineage seem to have come at about seven- or eight-year intervals: Eight years after the original is born in 1978 the first *Provisions* document is published

(1985); seven years later the 1992 edition of the *Provisions* was the first to have much of its content incorporated into all three model codes; eight years later the International Building Code came into existence in 2000, providing one definitive place for the *Provisions*.

Is it fair to say that the chapters on new building design in ATC 3-06 closely resemble those in the later *Provisions*, but that the chapter on existing buildings was only a starting point for much deeper development of that topic in projects you later oversaw for FEMA?

**Morelli:** That particular chapter was only a seed, but an important seed. It was a seed that was not nurtured until after 1984 when I started the ABE Joint Venture (ATC, BSSC, EERI). It had a planning workshop the year after. We can discuss existing buildings later, because that program came later.

Back to ATC 3-06, I can't comment on the technical details of the document, but I believe it is widely regarded as a quantum jump in the seismic engineering field. At the time, the SEAOC *Blue Book* was the *de facto* standard.<sup>24</sup>

**Reitherman:** Many of the same engineers in SEAOC who worked on the *Blue Book* were authors of ATC 3-06, though the ATC project had people from around the country like Nathan Newmark from Illinois. It seemed to provide a vehicle for making some bold changes, without having to worry that word-for-word it would suddenly become embedded in the legal requirements of the building code.

The Requirements section of the SEAOC *Blue Book*, by contrast, was adopted almost verbatim into the Uniform Building Code and applied in California and some other Western states.

Can we generalize that ATC 3-06 was the first important document that had a truly national seismic code perspective and that began to move the code development process to the national arena?

**Morelli:** Exactly. It was a significant advance not only technically, but it was explicitly—by design—nationally applicable. One of the national aspects of it, which I think had a lot to do with the work of the late Ted Algermissen, was national maps showing the probability of strong shaking on a consistent, comparable basis. So in my opinion, I would place ATC 3-06 in the category of ICSSC and BSSC as one of three pillars on which the early NEHRP effort was supported.

I should also note that while you regard ATC 3-06 as venerable today, it was controversial at the time. It had new thinking in it, and that always makes some waves. It also, because of its intent to be nationally applicable, was controversial with respect to who would develop seismic regulations and who would adopt them. Today, we have one national group, the Building Seismic Safety Council, BSSC, producing consensus-backed engineering provisions for new buildings, and one basic model building code, the International Building Code. But when ATC 3-06 was published, and for a decade after, there was the previous California system superintended by SEAOC and implemented through the UBC, and it took a long time to overcome resistance. There were then

24 Structural Engineers Association of California, *Recommended Lateral Force Requirements and Commentary*. 1959 and later editions up through 1997.

three model building codes, the BOCA and SBCCI codes in addition to the UBC.

**Reitherman:** The eventual fate of the *Blue Book*, now that SEAOC does not directly write seismic code provisions, was to make it into a series of carefully written and reviewed SEAOC essays on seismic design topics, commentaries on various codes, standards, calculation methods, and so on. It is still called the *Blue Book*, with the full title being *Seismic Design Recommendations*. So, the thinking of SEAOC engineers is still being documented, but not directly incorporated into the code as was the case with the UBC.

### BSSC on the Brink of Elimination or Success

**Morelli:** Covering so much new ground, it was inevitable that ATC 3-06 would generate a large number of critiques, corrections, and objections, as it was reviewed. I believe it was NBS—now the National Institute of Standards and Technology (NIST)—that kept a log of these.

The next phase of the ATC 3-06 effort, to implement it, began right away, within months after it was published. I have here a first draft of such a plan, dated July 1978, put out by the NBS.<sup>25</sup> I think Richard Wright at NBS started to get involved at about this point, and, fortunately for the program, came to play a very significant role until his retirement in the late 1990s, including that of chair of the ICSSC, Interagency Committee on Seismic Safety in

Construction. I will have much more to say later both about Wright and the ICSSC.

The NBS plan set out some objectives and logical steps for the assessment of ATC 3-06 in order to move it into practice. Trial designs of the provisions, trying them out on paper so to speak, was considered very important by the engineering community so they could have confidence in them, in how to use the new ideas, and to see how much the resulting construction would cost.

This in itself was a significant advance over the way previous building code regulations had incrementally evolved. The plan also served as a blueprint for the activities that the BSSC was to later undertake. It was recognized that engineers needed to be educated in the new provisions and methods of encouraging its adoption, as well as making the provisions themselves accurate and reliable. BSSC was not established until the spring of 1982, so four years went by without a proper home for fostering these activities. First came ATC 3-06, then the effort to revise and implement it, spearheaded by NBS, then BSSC.

So far, I'm describing some early ATC 3-06 and proto-BSSC activities that pre-date my arrival in these earthquake activities. I described how Thiel had moved from NSF to the Office of Science and Technology Policy, a stepping stone to FEMA when FEMA was established, and eventually became the head of earthquake activities in FEMA. The group that dealt with that activity changed its position and name in the organization chart at FEMA, but Thiel was consistently its leader and main driving force. In the years after ATC 3-06 was published, however, he became impatient with the lack of funding FEMA was

25 *Plan for the Assessment and Implementation of Seismic Design Provisions for Buildings* (draft). National Bureau of Standards, July 20, 1978.

providing to move it and related efforts along, so rather suddenly he left FEMA to go into consulting in the fall of 1981.

Almost by accident, I ended up in the role of trying to carry on his efforts within FEMA. It was one day in early 1982 when Richard Sanderson, who was by then in charge of the earthquake program in FEMA, came into my office. He had previously distinguished himself in efficient disaster response to Hurricane Agnes floods in 1972 while in FEMA Region III—the United States and its territories are divided up into ten FEMA regions, I through X. He had been called to the National Office shortly after Agnes to head the Individual Assistance program initially.

Sanderson explained that FEMA had been reviewing a proposal from a new group called BSSC for \$2 million, “and we don’t have that kind of money,” or words to that effect. He told me he wanted me to go to San Francisco for a meeting with their Board of Direction, and tell them that at most FEMA could give them \$600,000 this fiscal year and, if we got the appropriation for the next year, a follow-on \$600,000. My task was to ask them to reconsider their proposal and see if they could achieve acceptable results with the \$1.2 million budget.

The original \$2 million BSSC plan was closely based on the 1978 draft implementation and assessment plan I mentioned. There were to be over a hundred hypothetical buildings designed in about a dozen U.S. cities using the ATC 3-06 provisions, as they had been revised by NBS, in response to industry comments. Equally important to the funding of this effort was the fact that some early seed money Thiel

had obtained to keep the fledgling BSSC organization going with a minimum secretariat or central office functions was all gone, and the funding of the trial design proposal was the only way BSSC would survive.

So, I went to San Francisco in February of 1982, not knowing exactly what to expect but feeling the tension. I wasn’t exactly petrified to walk into a room full of people with whom at that time I had no ties, but I was concerned—I remember that uneasy feeling very distinctly even now. I was going to deliver the message that they were not going to get their \$2 million.

Later I learned that if they had not received any favorable word from FEMA, this was to be the last meeting of BSSC. The chair of BSSC at the time was William Moore, of Dames and Moore. He immediately made me feel quite comfortable. He had that capability to put people at ease. I told them what my charge was, and gave them FEMA’s offer.

Thiel was at the meeting. He urged BSSC to reject the offer outright, a position for which he had his arguments, knowing the proposal and the whole trial design plan so well. But it was a position that nonetheless made me feel very awkward, as you can imagine.

The group went into executive session, which really just meant that I left the room, because I was the only outsider present. So I cannot report on what they said, but I am sure there was some energetic discussion. I was called back in several hours later. They had found a way to still do a trial design effort that was acceptable to them, and which would fit the budget, by cutting the number of trial design buildings to some fifty and, I believe also by

scaling back some of the analysis. BSSC was on the brink of success, not failure, as it turned out.

In retrospect, what happened was that BSSC went ahead, the trial designs went ahead, ATC 3-06 evolved later into the NEHRP *Provisions*, and I spent the next twenty years or more working with this earthquake engineering community. But at the time, of course, you couldn't foresee how all that history would unfold.

**Reitherman:** Let me ask you to speculate a little about what was in the minds of people at the time. When ATC 3-06 was published in 1978, do you think that most of the authors foresaw that it would evolve into national provisions that would be adopted into America's building codes, and later into a single model U.S. code?

**Morelli:** No, I don't think that's what most of them thought, though I don't know for sure. I think many of the participants were just interested in technical advancements with regard to particular seismic design topics.

**Reitherman:** Then let me ask the same thing as of about 1982. What was in the minds of the first BSSC representatives? Did they think they would be the organization that would shepherd ATC 3-06 along that path toward adoption of NEHRP recommended provisions and the regular updating of them?

**Morelli:** By then—some four or so years after the original ATC 3 project was over—I think many of them had conceived the vision for a feasible development of a national consensus-backed set of recommended seismic

regulations. But, of course, it is all much clearer in retrospect than it was at that time.

## BSSC's Early Years

**Morelli:** When I arrived on the earthquake engineering scene in 1982, there was a very palpable fear of the federal government getting too much involved in building regulations. The private sector had a real distrust of the federal government in that respect. Only in the late 1980s, when it was obvious that BSSC was a free voice for the private sector, the various construction and materials industries and so on, that the distrust faded. We have achieved in the United States a nationwide set of seismic provisions, but it was not a federal set of regulations, and throughout my career at FEMA, I had to be very careful to make that distinction clear. FEMA was providing guidance documents, not enforceable codes.

**Reitherman:** In Japan, New Zealand, and some other countries, the seismic regulations have for a long time been written and adopted in the national arena through groups analogous to BSSC and often backed up directly by national codes.

**Morelli:** Also in Italy, France, and Canada. We have to look back 200 years at the 1780s and how the U.S. national government was set up, with due respect for the rights of the states and the private sector. In our case, the consensus recommendations come from the independent BSSC. Model codes and standards organizations like the International Code Council, the American Society of Civil Engineers, the American Concrete Institute, and so on, adopt their specific documents that pertain to seismic design. Except with respect to its own federal

construction, or when it provides some form of financial aid, which we can talk about later, the federal government does not adopt or enforce seismic regulations.

I don't know what you hear, but in recent years I have not heard any more about a fear that FEMA is trying to force a set of national regulations on the engineers and construction industry. When FEMA supports work to develop seismic provisions for new or existing buildings, such as through BSSC or ATC, no one seems to find that kind of federal activity controversial, but it used to be very much so.

**Reitherman:** All I have heard is simply a call from the earthquake engineering and construction fields for more FEMA support for and involvement in these kinds of efforts, not less. The SAC Steel Project after the Northridge earthquake is a case in point. By then, the earlier distrust of any federal role that you mention was long gone.

**Morelli:** I am glad that distrust has disappeared. At that time, though, it was one of my main concerns. But there was another concern, and a very personal one that I am discussing now for the first time publicly: my lack of preparation and background for the job that had been handed to me. Here I was, a social scientist with experience in managing people that went back to my Logos days over a decade earlier, but no engineering expertise, guiding an undertaking that was shaping very significant advances in earthquake engineering and construction. And if that was not enough, an atmosphere rife with rivalries among building materials interests groups (steel, concrete, etc.) and among building code groups, all deeply

distrustful of the federal government that I had somehow come to represent.

Ever so slowly over time, that distrust has abated, as you have indicated. I believe this very fundamental change in attitude came about through a combination of factors. Both the code groups and the materials groups—slowly at first—came to realize that FEMA was providing them updated information, often based on the latest research results that they could use to improve their own publications—all free. In addition, the materials groups provided me with an unexpected measure of comfort: they kept a sharp eye on each other, often challenging the other's proposal to protect their own particular interests. That in turn gave me some assurance that the margin for possibly serious mistakes was kept small.

On a more personal level, after a decade of turbulence, my personal life had settled down. I had met a wonderfully supportive woman—Dottie—whom I married in 1983—my second marriage—and so gained the necessary peace of mind and warm, strong companionship that I needed then and still enjoy now to carry on with some confidence the job that sort of just fell from the sky into my lap.

On the professional side, my greatest support in those difficult days, however, came from a powerful personality who appeared on the BSSC scene and dominated it during my work on both new and existing buildings until his retirement in the early 1990s: James (Jim) Smith.

The BSSC is made up of volunteers, all fully engaged in their respective practices or in running their businesses, and they serve for a

fixed period of time. It needs a person to provide continuity of purpose and run day-to-day activities. In the early days those functions were provided by the staff of NIBS, the National Institute of Building Sciences—a Congressionally-chartered entity into which BSSC was placed, by whom or which document I do not know. But as soon as BSSC could get some modest amount of funding from FEMA (I believe it was in the order of \$40 or \$50K), the Board of Direction, BSSC’s governing group, was fortunate to find an executive director in the person of Jim Smith.

Jim Smith in early 1982 had completed a long career with one of the big federal boards (I believe it was the Transportation Board) of the National Research Council, the research arm of the National Academy of Sciences. There he learned how to deal with competing engineering and materials interests and with building

codes organizations and the attendant problems. He is by nature friendly and gregarious, is accommodating when it is helpful in reaching an objective, but can be firm, as when defending BSSC’s interests—as I learned early on. This combination of experience and personality was just what the program—and I—needed at that time and his appointment turned out to be a stroke of genius on the part of the board and a blessing of gigantic size for me. The program would not have made as much progress without him.

Jim Smith essentially created the position of BSSC’s Executive Director and put his indelible stamp on it. He represented BSSC in the myriad of contractual and similar activities with FEMA and therefore he and I developed a close professional relationship that worked out to be very beneficial to both the federal government and the private sector. I can never sing enough praise of him.



# FEMA Program on New Buildings

*The yellow-covered books were easy to spot on desks and in bookcases all over the world.*

**Reitherman:** Let's retrace our conversation a little way back to the trial designs. What happened next, after they were funded and BSSC had a renewed lease on life?

## **BSSC Trial Designs**

**Morelli:** I have refreshed my memory about the specifics of this program, that by now dates back more than twenty years, from a brochure prepared by Jim Smith. Compared to the animated and musical PowerPoint presentations of today, it looks hopelessly poor and dated, but nonetheless in a little more than four pages contains a great deal of information. The program started in late 1982 and was divided into two phases, to conform to the funding that we could count on and its timing. It was primarily intended to test the "technical viability" and "predict [the] economic impact" of the *Tentative Provisions*, as modified by a joint BSSC-NBS effort that had by then made some 200 modifications in the original content.

The first phase covered twenty-seven hypothetical new buildings of different configurations and occupancies in four cities of medium and high seismicity: Los Angeles, ten buildings; Seattle, five; Phoenix, six; and Memphis also six buildings. Teams of professionals from seven cities were selected to design each building twice, once according to the prevailing local codes, including whatever seismic provisions existed at the time, and a second time according to the modified *Provisions*. Both the conduct of the study and its results were examined extensively by a special committee of nationally recognized experts in seismic engineering of the BSSC, with NBS participation. Among other conclusions, the committee recommended a substantial number of changes to the *Provisions*, which were vetted by BSSC and then incorporated in a new revision of ATC 3-06.

Phase two of the trial designs used this further-modified ATC 3-06 as the basic document. This phase covered an additional seventy-three buildings, with ten more in Los Angeles, eight in Seattle, six in Memphis, and two in Phoenix, and three new cities: New York with twenty-one buildings, Chicago with eighteen, and Minneapolis with eight. Thus the whole program covered 100 buildings, hypothetical and idealized buildings, but of realistic design.

To the best of my recollection, the technical changes were substantive and very numerous, with some being highly contentious because they impinged on the vital interests of the different materials manufacturers. They covered all major aspects of the *Provisions*, from overall design concepts to detailing of major members,

including the famous *R* factors, which, incredibly are still with us. The differences were slowly resolved by the consensus process of BSSC, however, and in 1985 the first edition of the *NEHRP Recommended Provisions for the Development of Seismic Regulations for New Buildings—Part I: Provisions and Maps*, and *Part II: Commentary*, finally came to life, eight full years after ATC 3-06 was completed.

One controversy has stuck in my mind—and sounds particularly silly in retrospect, but was very real at the time. It centered on the word “recommended” in the title of the document. Horrors! The federal government “recommending” building regulations? To some, it was sheer anathema. But the word remained and it is still in the title of successor documents to this day. This is where the consensus-building process at the committee and at the top levels of the BSSC proved invaluable. It justified fully the intent and the hopes of its founding fathers (and founding mother—yes, there was one woman on the first BSSC Board).

### 1985 Edition of the *NEHRP Provisions*

**Morelli:** In the creation of the 1985 edition, BSSC by and large used the same organizational structure and procedures used for the ATC 3 project, but streamlined them considerably. Notably, the number of committees and the levels of management were drastically reduced. The technical development and the actual wording of the content of the *Provisions* and *Commentary* continued to be done at the technical committee level initially, using the traditional consensus process. In addition to a committee for each of the major materials,

there were several others that dealt with such cross-cutting issues as design and testing, for example. Conflicts that could not be resolved at the committee level were referred to the PUC, Provisions Update Committee, for adjudication and resolution, also by consensus process. The BSSC Board was the final arbiter for the handful of remaining issues, generally just a handful, deciding by voice vote. All along, the process was carefully followed and prodded forward, occasionally with vigor, by Jim Smith, who, if truth be told, in his usual quiet, but effective way informally resolved several very knotty differences of opinion.

I, and, by extension FEMA, deliberately abstained from interfering with the committee process, although invited and even urged to participate to any extent that we wished. This was a policy that I established on my own, always mindful of the distrust of the Feds we spoke off earlier. To its eternal credit, FEMA never questioned my position on this issue. As a matter of fact, I should add that throughout my stewardship of this portion of the NEHRP, FEMA gave me an unusual amount of freedom and support. In return, I hope I provided FEMA with some tangible results to report to congressional committees that by then had begun to inquire about what the NEHRP was accomplishing at FEMA.

The 1985 edition of the *Provisions* caused quite a buzz, as we would put it today, and some considerable controversy. Of the three major building code-writing organizations, ICBO gave that edition a decidedly hostile reception, for motives that I will leave you to speculate about, although many of its members had participated in the preparation of both ATC

3-06 and later *Provisions* in various capacities. The more knowledgeable engineering firms located in the large cities of the West Coast and a few eastern cities were more prone to use them. The smaller the firm, the more difficult the *Provisions* appeared to be in their application. Be that as it may, *Engineering News Record* selected its completion by ATC-BSSC as one of the top fifty accomplishments for 1986 and, compliments of BSSC and FEMA, I got to attend the black-tie awards dinner with representatives of the other forty-nine selected projects in New York City in February 1987.

The BSSC process was not only time-consuming, but also costly. On the average, as I recall, it cost about \$750,000 (in terms of late 1980s dollars) per year, in spite of the fact that the participants were all individuals that volunteered their time and talents to this cause. That sum was needed to cover their travel and lodging expenses and the BSSC salaries and expenses. Fortunately, by that time FEMA had become part of the federal budget cycle, thereby gaining some sense—but never a guarantee—of funding stability. The feeling of stability was strengthened after the 1984 reauthorization of the NEHRP, when appropriations were increased, as I recall.

The funding level for the four major NEHRP agencies began to climb toward the \$100 million level, with FEMA's portion amounting to about \$20 million. (These figures include salaries and other expenses, as well as program funds.) Incidentally, these levels have remained the same for over twenty years, constantly eroded by inflation and other factors, such as "taxes" imposed on the NEHRP by the Department of Homeland Security upper

management. Only after the 2004 reauthorization of the NEHRP did the level go up some 20 percent.

I tried to stay out of the detailed FEMA budget preparation process as much as possible, because it was not only tedious and time-consuming, but often acrimonious. I limited my role to fighting for as much as I could justify for my projects—and then a bit more, I must now confess. I also kept on the alert for any possible “year-end dollars” or other “leftovers” to fund tasks that I always had defined and ready to be added profitably to my ongoing projects. By 1986 I had earned such a reputation in this area that I was humorously awarded the informal “Sponge Award” by my FEMA colleagues that year.

## Yellow Book Series

**Morelli:** The *Provisions* are by now old hat, but they represented a new way of looking at seismic design and its requirements for the overwhelming majority of engineers and architects at that time.

They had to be “translated” and “explained” if we wanted them to be applied widely—the hope that motivated all the efforts expended on them. Thence came the first series of supporting reports—a sort of “*Provisions* for Dummies.” There was one for each major specialty, including engineers, architects, and building officials—and there may have been others. Some were widely used, but one in particular has remained impressed in my mind, because the one for building officials was a dud, judging from the fact that most copies from the one and only printing languished in the FEMA Document Distribution Center for many years.

Another report in this same series of reports, *Societal Implications: Selected Readings*, published by FEMA in 1985, deserves some elaboration for several reasons. First of all, unlike the others, it was directed at nontechnical participants of the building process, a first of its kind. Also, either directly or indirectly, it has been quoted—and in some cases misquoted—at least as frequently as the *Provisions* themselves. That is because, tucked away among the others, one reading deals with costs of including seismic considerations in the design of new buildings. It was prepared by a member of the economics group at NBS whose name I have long since forgotten. He took a set of data gathered, often not too rigorously, by the designers of the 100 trial design buildings and deduced the incremental costs involved in this new design process. As is to be expected, costs varied, at times considerably, from one city to another, but the “average” was pegged at about 3 percent. And that is where it stands to this day. And nobody, including me, in more than twenty-five years has had the energy and resources to address this very important topic in the rigorous manner that it richly deserves.

Another series dealt with how to apply the *Provisions* to a select number of particular types of buildings with special occupancies or functional characteristics, namely elementary and secondary schools, health care facilities, office buildings, apartment buildings, and hotels and motels. These manuals stressed the major design considerations that were peculiar to these types of buildings that had to be kept in mind in designing them, with cross references to the appropriate portions of the *Provisions* themselves.

The needs of nontechnical audiences were also addressed. *Seismic Considerations for Communities at Risk*, FEMA 83, published 1985, was directed at building owners and local decision-makers and in nontechnical terms educated them on the nature and extent of the seismic risks in this country and the effects on buildings, on how the new design provisions could mitigate them, and on the importance of up-to-date building codes. *Nontechnical Explanation of the NEHRP Recommended Provisions* stressed the way the *Provisions* captured the characteristics of the seismic environment of an area and the effects of criteria and requirements that engineers and architects could use in designing buildings that could better withstand earthquakes.

**Reitherman:** Before we go much further, tell me about the so-called “yellow books” and your involvement in setting them up. Everyone in the earthquake field is familiar with the FEMA-published earthquake books that have yellow covers.

**Morelli:** I thought you would never ask, Bob. Just make sure you get that nickname in lower case letters, otherwise members of the old Ma Bell brood might get after us for copy-right or other infringements.

**Reitherman:** It’s also been said that “just follow the yellow book road” is a good description of the FEMA earthquake program, but so far MGM hasn’t sued for stealing a theme from the *Wizard of Oz*.

**Morelli:** First of all, I need to emphasize that I had nothing to do with setting up the system. I just used it in the publication of the volumes for which I was responsible until I

retired. In any case, I do not remember exactly the year, but it must have been in the early 80s, when the FEMA National Office, the FEMA Regional Office in San Francisco (Region IX), and SCEPP (Southern California Earthquake Preparedness Project), all started publishing materials dealing with various aspects of the earthquake threat in California and the rest of the country on their own, causing confusion at times as to the origin of the documents, intended audiences, and similar fundamental considerations.

Several of us in the program expressed concern about the situation and started agitating for some sort of system to keep track of who was publishing what in the various FEMA-funded earthquake projects. The then-head of the program in FEMA agreed and asked a member of the staff to set up such a system and get the agreement of the FEMA Publication Office. How or why she was picked is lost in the fog of history, but fortunately, the lot fell to a very close and dear colleague who recently retired after a very fruitful career with FEMA and in the private sector. Her name is Terry Baker.

As Terry recalled with me recently, after many other details were settled with the Publications Office, the question arose of what color covers the new earthquake series would have. For cost reasons related to the stiff paper cover stock to be used, the choices were meager indeed: a shocking pink, a sickly green, or the by-now-famous yellow (yukky yellow, as I have often referred to it). The selection was not difficult. And the rest is history, in the trite expression. In fact, I was recently told that they were even being translated into Pashto and Hindi, although I have not been able to confirm that.

But there is a sad P.S. to this tremendous success story. The ninnies in the Department of Homeland Security, upon taking over FEMA and twenty-one other organizations decreed in their infinite wisdom that all DHS publications shall henceforth have white covers and a photo—NO exceptions. So the yellow covers are gone forever for new earthquake publications. Thus, a strong worldwide brand recognition that all the Fortune 1000 would have killed for was destroyed forevermore. You figure, Bob.

**Reitherman:** Brands are so hard to establish. Now please go back a little to the *Provisions* and how they began to work their way into the model building codes. For the readers' benefit, let's recall that in the 1980s there were three large model codes in the U.S.A: the Uniform Building Code (UBC), prevalent in the West and Midwest; the Building Officials and Code Administrators Code (BOCA), used in the Northeast and East; and the Southern Code (SBCCI) used in the South, not to mention significant local codes in some large cities. In 2000, the three model code organizations merged and produced the International Building Code.

**Morelli:** The revision of building codes in those days generally followed a three-year cycle. So it made sense to tie the updating of the *Provisions* to that same cycle. The updating process turned out to be just as slow and plodding as the preparation of the 1985 edition and was not completed much before the time of the updating of the model building codes. BSSC by and large used the same management, organizational structure, and procedures as in the creation of the 1985 edition. Only a few

changes in committee chairs and committee members were made. And the cost per year was also approximately the same. The work, as best I can recall, proceeded rather smoothly. Participants in the effort knew each other's "hot buttons" well by then from work on the 1985 edition and as well as from other venues, and dealt with them cautiously. The major advance was made in the masonry chapter, based on the results of a concerted and focused effort sponsored by NSF. As a matter of fact, the chapter was rewritten in its entirety and caused some considerable controversy, but at the end passed the usual balloting.

After the publication of the 1988 edition of the *Provisions* and *Commentary*, we proceeded to revise all the supporting documents that had been prepared after the 1985 edition that I mentioned earlier. Thus they remained relevant, reflecting the advances and changes that had been incorporated in the *Provisions*. Aside from the one directed at building officials, all the rest went through the updating process. But a new one was added that detailed the differences between the 1985 and 1988 editions. It was another attempt at easing the transition from one document to the other by practicing professionals, some of whom were still struggling to absorb the new concepts and procedures contained in the original *Provisions*.

As soon as one cycle was completed, the next one followed and the preparation of the 1991 edition began. With a steady and dependable stream of funding from FEMA, the continuity of purpose and direction of the effort was maintained, with the BSSC Board, and Jim Smith especially, assuring broad participation of the engineering and related communities.

As in the previous transition from one edition to the other, there were some changes in the management and composition of the technical committees, but nothing drastic. On the FEMA end, however, there was at least the beginning of a change. Let me explain.

Shortly before these preparations started, the earthquake program acquired from the Flood Program a new member, Michael Mahoney, a physicist who had joined FEMA from private industry a short while earlier. I was already deeply involved in the parallel program on the seismic safety of existing buildings that I had started in 1984, as we can talk about later, and frankly was overloaded. My repeated pleas for help were finally answered and Mahoney was assigned to work with me. It was obvious to me from the very beginning that he was more than capable to shoulder the management of the 1991 edition by himself, but he insisted that I remain involved and I agreed to, at least nominally. In reality, however, Mahoney took over the preparation of the *Provisions*, establishing himself very quickly not only with BSSC but also with the whole earthquake engineering community, gaining their respect and the same degree of support that I had enjoyed. My exit from the part of the program dealing with new buildings was smooth and almost imperceptible, thanks to Mahoney's background, knowledge, and personality. And he has expertly and successfully continued in this role ever since, expanding it to cover related areas, like the investigation of the failure of steel buildings after the Northridge earthquake in 1994 and the development of new performance-based design concepts and techniques more recently.

## Wider Participation in the Yellow Book Series

**Morelli:** Up until now, I've described how BSSC had been the central point of FEMA earthquake activities, in the sense that, within the constraints of our contract with them, it marshaled the talent and other resources necessary for specified tasks, e.g., the preparation of the *Provisions* and supporting documents, and then managed the completion of each defined task. Questions of policy and of a similar significance came to me for final resolution. As the program for existing buildings progressed, a new business model slowly came into being. In such a model, BSSC continued to play a significant role in often subjecting the new reports and manuals to the consensus process; but more and more FEMA came to deal directly with individual firms or teams of firms, and eventually, with standards-setting organizations.

This new management arrangement complicated very considerably my work. It required more of my time to prepare the necessary documentation for a competitive bidding, get it through the contracting FEMA organization, lead the evaluation of competing firms, participate in negotiations with the winner, and finally launch the project. The extra effort, however, was well worth it. It resulted in a broader direct participation of the earthquake engineering community and more direct influence of experts in the field. In the process, more up-and-coming younger design professionals were given the opportunity to contribute not only their energy, but new ideas and approaches. A much needed rejuvenation process ensued that bore ample fruit.

During the seven years after the 1985 edition of the *NEHRP Provisions*, that is by 1992, a dozen or so reports, handbooks, or manuals on key aspects of seismic safety of existing buildings were produced, updated as needed, and published. By concept and design, they were a cohesive, consistent, and carefully reinforcing set of documents that enjoyed broad consensus of the user communities and were specifically

designed for national applicability. A very serious attempt was also made to ensure that the set was truly interdisciplinary by having the reports address not only engineering and architectural design but also societal problems. The overall structure of the program that was set at that time (the late 1980s and early 1990s) survived intact until I retired.

# FEMA Program on Existing Buildings

*Unlike my entry into the field of new buildings, nobody told me to look into the subject of existing buildings.*

**Reitherman:** Your account of the FEMA program on new construction brings us to the subject of the FEMA earthquake program on existing buildings that you managed. It might seem logical that the first FEMA program would deal with the numerous hazards posed by existing buildings, which generally perform more poorly in earthquakes than new ones and account for more loss. But as it happened, first came the NEHRP provisions for new buildings, and only later did the program on existing buildings come along.

**Morelli:** Unlike my entry into the field of new buildings, nobody told me to look into the subject of existing buildings. To me, it was a most logical expansion of what I was already doing. All I had to do was look out the window to realize that new buildings are but a very small fraction of the built environment—two to three percent, as was computed several years later by Dr. Richard Wright of the National Institute of Standards and Technology. And so began

in 1984 the last and most satisfying segment of my FEMA career, extending up to my retirement from the agency in early 2003.

## Conditions in the 1980s Ripe for a New Initiative

**Morelli:** The general conditions seemed appropriate for the new undertaking from several points of view, although in many ways, the existing building problem is more difficult than the problem of designing and constructing new ones to perform well in earthquakes. FEMA was slowly “learning to walk” among independent agencies, some of which, like the Nuclear Regulatory Agency, had existed for twenty-plus years, to cite only one example. It was learning to prepare, present, and defend its vital interests (budgets and personnel levels) and consequently was getting more resources. In turn, this meant that the FEMA earthquake program was slowly getting more funds, from less than \$1 million in 1981-82 to about \$3 million in 1983-84. So with reasonable assurance that the *Provisions* and its related yellow books could be kept alive, there was a good possibility that the expansion to existing buildings could be at least minimally nourished—and in fact that turned out to be the case; not without some bureaucratic maneuvering on my part, however.

The supporting institutional framework—namely the engineering community and especially BSSC and Jim Smith—was proving to be stable, increasingly dependable, effective from my end and more accepted from the users’ side, and smoothly operating. For example, it became easier to recruit top talent to accept membership in the various BSSC committees

on *pro bono* short assignments at considerable personal financial sacrifice.

Also, members of the engineering community who were already participating in FEMA efforts began to urge me to start working on existing buildings, stressing the familiar arguments of the seismic vulnerability of such buildings and their large numbers in often poorer sections of city centers. On the other hand, there were dissenting voices, probably prompted by concern that the effort on new buildings, that by that time was apparently gathering headway, might suffer as a consequence of dilution of resources and talent. Also, fear of federal meddling in what had heretofore been a private industry or state and local matter—mentioned earlier—was also slowly and almost imperceptibly beginning to wane.

Looking back, there was also a strong personal component of the move toward existing buildings. First of all, my private life was finally calming down after nearly a decade of continuing stress, thus removing what must have been a drain, although unknown by the outside world and hardly perceived even by me at the time. Further, my self-confidence had increased. I felt more comfortable dealing with earthquake design professionals and other members of the building industry than I had at the beginning, probably due to the fact that I had a sense of having become more acceptable to them, mostly because of my position at the principal funding agency for these kinds of efforts. And I am convinced that this personal attitudinal development was greatly facilitated by Jim Smith’s gentle but constant guiding influence.

**Reitherman:** There were some unreinforced masonry local government programs in California, and some seismic upgrading of older public school buildings in that state, but what about federal agency programs?

**Morelli:** At that time, federal efforts in this country on existing buildings were limited in number. There was the program being conducted by the Veterans Administration, (now the Department of Veterans Affairs) that was spurred by the regrettably poor performance of some of the VA's facilities located in the area affected by the 1971 San Fernando earthquake and consequent loss of lives, particularly the collapses at the Sylmar hospital. That program covered a few building types also found in the general building population, but was primarily devoted to medical facilities. In addition, it was a mandated program, with the Congress enacting it and also funding it rather well and consistently to this day—conditions still lacking in the NEHRP existing buildings program. DOD, the Department of Defense, also had a program to deal with existing buildings on its many seismic locations and a tri-services manual on seismic construction, although that publication was directed for the most part to new construction.<sup>26</sup>

In addition, the then-young Applied Technology Council had just started work on the development of a methodology for the

seismic evaluation of buildings that resulted in the well-known ATC 14,<sup>27</sup> the distant progenitor of ASCE 31<sup>28</sup>. Also, some fundamental knowledge about existing buildings was available from NSF-sponsored research results, but it was fragmentary and “curiosity-driven” (to use a term now fashionable). It covered topics selected because of the preference or specialization of the individual investigators rather than to close a significant gap in knowledge in the field of existing buildings.

The only other existing buildings efforts of which I was aware were those conducted by the Japanese. Dr. Robert Hanson, then at the University of Michigan, had worked with the Japanese and had published a rather extensive compendium of the seismic rehabilitation techniques that they were using. He gave me a copy of the compendium (the title of which has unfortunately been lost in the fog of history) and urged me to start a comprehensive program in this country.

It soon became evident to me that such a program had to be created practically “*de novo*.” And in doing so, I was also determined to overcome what I had observed to be a major flaw in the program for new buildings, namely the lack of consistency in the meaning of fundamental terms and values. If a user moved between such fundamental documents as the SEAOC *Blue*

26 *Seismic Design for Buildings*, Departments of the Army, Navy, and Air Force, Washington, DC, 1966. The 1973 edition included guidance for the then-new technique of dynamic analysis as compared to equivalent static lateral force analysis.

27 *Evaluating the Seismic Resistance of Existing Buildings* (ATC 14). Applied Technology Council, Redwood City, California, 1987. Degenkolb Engineers was the primary author of the publication.

28 *Seismic Evaluation of Existing Buildings* (current edition ASCE 31-03). ASCE, Reston, VA, 2003.

*Book*, ATC 3-06, and the *Provisions*, to mention only a few, basic concepts like building types and structural systems were different from one document to the other and values of fundamental factors, like the *R* factors, often differed, at times significantly.

From the very beginning, therefore, I was determined that in all fundamental respects the products of the FEMA program on existing buildings would be “coherent” and “consistent.” And these two terms were emphasized in the introductions to the first half dozen or so products (introductions which, incidentally, I wrote—in spite of the fact that they all were “signed” with “FEMA”). Looking back it seems to me that we succeeded in maintaining this cohesion and consistency in the products of this program (at least until I retired), although as time passed, some modifications or explanations became necessary as a result of new knowledge generated by research or by experience.

## ABE Joint Venture

**Reitherman:** Say a few words about the role of the ABE Joint Venture.

**Morelli:** The first logical step to move into this new field – at least it was brand new to FEMA—seemed to be a workshop that would develop a plan of action to guide the new activities for the following five years or so. Several organizations showed a strong interest in leading the effort. In the end, with some gentle prodding, a consortium emerged, the ABE Joint Venture (ATC, BSSC, and EERI) and was given a contract for about \$200,000. In due course Arizona State University at Tempe was selected as the venue and March 1985 as

the date for the workshop. The overwhelming majority of the fifty or so invited participants were already playing a major role in the preparation of the *Provisions* for new buildings, a situation that undoubtedly enhanced the quality of the final products. Interesting to note is the fact that many of them paid for their own expenses.

The Arizona meeting was the first time that what was needed to undertake a comprehensive program of seismic safety of existing buildings had been carefully considered, discussed, and distilled into a distinctive set of requirements. Principally because several important requirements have not yet been met to this day, a quarter century later, it seems worthwhile to record a sample of the wealth of major ideas that emerged.

Looking at the ABE workshop document I have, here are nine basic calls for action: 1) a series of engineering and application “guide-books” to give local building officials the basic knowledge to inventory, assess the seismic risks, and determine the means to strengthen deficient existing buildings for life safety; 2) a series of research projects to determine the strength of existing buildings by nondestructive means; 3) a set of provisions on existing buildings similar to that in preparation at that time for new buildings; 4) identification of special design and engineering needs of historical buildings; 5) topics for a political action plan to galvanize citizens into supporting local abatement of hazardous existing buildings; 6) an inventory of strengthened buildings as a resource repository for researchers and practitioners; 7) a clearinghouse of information on all aspects of seismic strengthening of existing

buildings for the use of all interested audiences; 8) a handbook on liability of designers and public officials connected to strengthening of existing buildings; 9) training materials and courses for practitioners and officials who are active in strengthening existing buildings.

The Joint Venture contract produced two “yellow books,” a volume recording in considerable details the workshop proceedings and another that became the Plan of Action (FEMA 90). The former contained details of the discussions in the break-out and plenary sessions and resultant recommendations, together with the commissioned papers. Aside from an introduction and executive summary, the Plan of Action consisted of four functional segments: research and engineering, societal, information dissemination, and historical buildings. Segments were subdivided into tasks and subtasks and each task in turn contained a description, intended users, cost, duration, and time phasing. There were a total of twenty-five tasks, costing about \$40 million (in 1985 dollars), spread over a five-year period, with thirteen of them (costing \$3.2 million) needing to be started promptly because they were intended to produce results required by subsequent tasks. Both volumes were published by the end of 1985.

Advice from potential users of materials on existing buildings was readily available, but contradictory. It covered the gamut of opinions, from caution on the grounds that the information at hand had too many significant gaps, and therefore would yield unreliable, hence useless, results, to rather vociferous favoring of a project along the lines of ATC 3 to produce a set of provisions similar to those

that were being prepared for new buildings. At the end, lack of assurance of increased funding and without somebody to work with me in this area, plus my rather cautious nature, combined to lead me to decide to take a gradual approach.

In operational terms this meant identifying and creating the building blocks that would eventually lead to a volume on existing buildings similar to the *Provisions* on new building. An image slowly formed in my mind, that of a Roman temple, with the Tempe, Arizona workshop proceedings and the Plan of Action forming the foundations and base; several volumes on various topics (yet to be determined) being the columns; and the rest of the edifice, the cornices, pediment, roof beams, etc. spanning over it all to culminate in the unified set of provisions on existing buildings.

## Evaluation of Existing Buildings

**Morelli:** The volume that followed shortly after the first edition of the NEHRP *Provisions* for new buildings concentrated on the evaluation of an existing building by visual screening, FEMA 154. It used a methodology, first developed in the venerable ATC 14, *Evaluating the Seismic Resistance of Existing Buildings*, that I have already mentioned. Started in the early 1980s and completed in 1987, ATC 14 is based on a rather extensive set of questions that are applied to each of sixteen basic types of buildings—termed model building types.

**Reitherman:** Those model building types are still with us, often used in classifying large inventories of buildings, such as in FEMA’s HAZUS program.

**Morelli:** Those categories organized the questions that were intended to identify flaws in both structural and nonstructural components in each type of building. A “true” answer signified no need for further analysis or concern and a “false” flagged the area as one requiring further analysis. The direct lineage of the current FEMA 154 and ASCE 31 to this ATC landmark document can very easily be traced through several updates of the original version of FEMA 154—I called them “editions”—that took place during the 1990s. More on this subject later.

A companion supporting documentation report reviewed other similar evaluation methodologies and justified the approach used in these two evaluation documents. The justification consisted of a validation test that applied the methodology to some 100 buildings located throughout the country that had been previously evaluated using different methodologies.

## Guidance on Strengthening Techniques

**Morelli:** The next volume that was undertaken (FEMA 172) was intended to give design professionals the best known techniques for eliminating the deficiencies identified in the evaluation manuals. An ample—for the days before desktop publishing—amount of sketches, diagrams, and checklists were included to facilitate and encourage the consideration of alternative evaluation approaches and the selection of the most appropriate to a specific building location, occupancy, and structural system. Further, the manual aided users to move from evaluation to rehabilitation by being organized to address building systems

and components in parallel fashion in both FEMA 154 and in FEMA 172, including identical comparative tables when feasible. The concept of a coordinated set of volumes was working in practice.

The volumes were definitely pushing the state of the art by attempting to set “generally accepted” standards of seismic evaluation that design professionals could put into practice and by offering techniques that could be used to overcome deficiencies that had been uncovered. From many subtle and not so subtle indications that I perceived, however, it became obvious that I needed to proceed with caution in issuing these documents, if I wanted to ensure even a moderate degree of acceptance by the user community. The only way that was available to me was to subject them to a consensus review process similar to that used by BSSC for the *Provisions* for new buildings.

This process turned out to be contentious, laborious, and prolonged (i.e., expensive) for two main reasons: the subject matter was new, hence the cautious, conservative reviewers almost instinctively found faults with the volumes or were overly protective of their respective turfs in the case of representatives of various materials. Also, the first drafts contained technical errors that needed correction and significant omissions that had to be taken care of. Eventually, the requirements of the consensus process were fully satisfied and both volumes were approved, but by then it was 1993.

## Costs and Societal Aspects

**Reitherman:** The cost of upgrading existing buildings in monetary and social terms

is obviously a major issue. Describe how the FEMA program dealt with that topic.

**Morelli:** The program began to address societal (nonengineering) topics with a number of reports: one on costs of seismic rehabilitation, FEMA 156, and another on an approach to establishing a community-wide program of seismic rehabilitation, FEMA 174, both with accompanying supporting documentation volumes; a third attempted to deal with incentives; and a fourth tackled the difficult area of benefit/cost.

While costs for rehabilitating a single building or portion thereof are determined routinely, costs truly representative of a large number of buildings in an extensive area, let alone the whole country, are not economically feasible to collect to this very day. So the first problem that I faced in preparing FEMA 156 was a matter of terminology: what to call the costs that could be gathered from readily available data, mostly from the files of the few firms that voluntarily participated in the initial effort. I finally settled on the adjective “typical,” which really meant “best available with a reasonable expenditure of public funds.” And so the data have remained “typical” for two decades through the several editions of this volume.

The original edition was based on a sample of some 600 buildings. It provided direct costs per square foot of building area for each of the fifteen basic building types that would be incurred to achieve a life-safety level of rehabilitation. A stab was also made at determining indirect or societal costs, but it produced only generalities, I regret to say.

In the second and third editions, the sample was expanded from about 600 buildings to about slightly more than 2000, if I remember correctly. The data were then scrubbed thoroughly by eliminating data that proved to be suspect for a number of reasons. This edition seemed to be a bit more acceptable than its predecessor, but not by much. In the third and last edition, for which I was responsible, a University of Illinois professor applied a complicated mathematical analysis to improve the data reliability from a statistical viewpoint, and (after I retired) developed a web-based calculator to encourage its use by potential users.

Contemporaneously, a handbook was developed to facilitate and encourage local authorities to undertake seismic rehabilitation in their respective communities, with step-by-step guidance on how to develop a program.

As had become customary by that time, a companion volume provided more in-depth coverage of the same topics covered in the handbook itself, including copies of relevant local ordinances. Necessary and useful as the effort might have appeared at the time, it is my recollection that the two volumes were not extensively used and no subsequent edition was therefore prepared.

Another document in the societal series was originally designed to identify and describe existing incentives in the private sector and at all levels of the public sector. The initial data gathering, however, revealed that no incentives were in place anywhere and even potential ones were constrained by political and economic reasons. The effort was therefore re-directed to the creation of an “agenda for

action” that a community or a firm could use to encourage seismic rehabilitation.

The last volume of the series that dealt with societal issues covered the ever-controversial public policy issue of benefit/cost of seismic rehabilitation. Twenty years or so ago, very little had been done in the way of benefit/cost analysis of seismic rehabilitation, although a few federal agencies, notably the Federal Aviation Agency, the FAA, had made considerable progress in this general field. As I recall, the effort we undertook faced two major problems. The first—still with us today—was availability of data on the seismic rehabilitation of existing buildings. The second problem seems hard to believe today, with the passage of time and the practically inexhaustible availability of computer capacity today: it was to find a program large enough to handle the expected quantity of data. The final choice—QuattroPro—turned out to be unfortunate, because the program was used, at least in higher educational circles, on the West Coast, but was almost unknown in the East. The practical consequence of this choice was to limit the use of the product of this effort almost exclusively to the Western U.S. Nonetheless it remained the only available benefit/cost tool available in this field for over a decade.

### Early 1990s: The “Roman Temple” Components in Place

**Morelli:** Looking back, by early 1990s then, the load-bearing “columns” of the “Roman temple” were in place in the form of reports on specific topics. The foundation had been the workshops and setting the strategy in the mid 1980s. With several yellow book guidance

documents in place, work on the “pediment” started almost immediately, to produce the unification of the all the preceding work, but the completion would take another seven years, as it turned out to be, and almost an additional five for the information to reach users in the form of nationally recognized and applicable ASCE standards, till my retirement from federal service in early 2003, as a matter of fact.

At this point I believed that we were ready to start work on some sort of a reference document for existing buildings, similar to the *Provisions* for new buildings. In many subtle as well as overt ways, however, the strongly conservative segment of the seismic engineering community let it be known that it believed that there were still too many significant problems that needed to be addressed, and that I was a bit too anxious to proceed.

**Reitherman:** Was that reluctance partly based on the greater degree of difficulty in providing standards for existing buildings, as compared to new ones?

**Morelli:** For the most part, I believe that *was* the basis, and there were many who opposed undertaking this new initiative. In retrospect, they were proven right, given the time (almost a decade) that it took to complete an acceptable reference volume. Again with the advantage of hindsight, this was the first small dark cloud on the horizon that eventually became a raging storm that destroyed that strong bond that I had developed with BSSC since almost its birth. But I am getting ahead of events. At this point, the program took a slight “detour,” so to speak.

## ATC 28, FEMA 273 and 356, and ASCE SEI 41-06

**Morelli:** The detour took the form of an intensive effort—lasting some thirty-six months and eventually identified as Phase 1—with the overarching objective of a report that would identify the most difficult engineering problems standing in the way of writing a fundamental reference document on existing buildings. The effort began in the fall of 1989, using funds that I had originally intended to use on the reference document. Christopher Rojahn, ATC’s executive director, provided overall management of the effort as well as leadership of the technical segment. Susan Tubbesing, executive director of EERI, convened a very inclusive workshop that provided critical review of the results and suggested many needed changes. A newly constituted committee of the American Society of Civil Engineers (ASCE)—a new player in the FEMA program—subjected the completed volume to a consensus review, thus marking the beginning of ASCE’s very significant role in subsequent existing buildings activities led by Thomas McLane, who was a newcomer in the seismic arena. In manning the effort ATC deliberately cast a wide net to ensure a large representation of all the major organizations and players in this field, enlisting their participation in varying capacities.

**Reitherman:** For the reader’s benefit, let me mention here the relevant genealogy. The ATC portion of the project, the actual seismic rehab guidelines writing, was called ATC-28. The first FEMA published version of the guidelines was FEMA 273, later revised into FEMA 356. And the standard that could be

adopted by reference in building codes was ASCE SEI 41-06 (American Society of Engineers Structural Engineering Institute standard number 41-06). When FEMA began the process with the ATC-28 project, no one knew that the end result would be an ASCE standard.

**Morelli:** That is correct, Bob. It is interesting to note the absence of BSSC from this consortium. All the while remaining within the stringent confines of federal acquisition management (it used to be called “procurement”) I engineered this consortium. For some time, I had been pondering about means to accelerate the process of incorporation of new construction engineering advances into model codes and from there into actual practice. The role played by BSSC had shortened such a process by at least half a dozen years. I speculated that the incorporation into the process of a standard-setting organization would provide a further much-needed acceleration. By “standard-setting” I mean an entity that follows the procedures of the American National Standards Institute (ANSI) or American Society for Testing and Materials (ASTM) in the development of documents and is so recognized. An elaborate process of public notice, filing of comments, response to comments, and voting by properly empaneled representatives of broad interests is required. BSSC had considered becoming such an organization, but at the end decided against it, presumably for financial reasons. This thinking on my part explains the inclusion of ASCE in Phase 1 and proved to be correct.

## ATC 28 Issues Report That Began the Project

**Reitherman:** Looking at this as a historian, here's my view of what happened, how the early existing buildings reports we're discussing achieved such a breakthrough, prior to when "performance-based seismic design" was a buzz word. How surprising that this leap occurred with regard to the more difficult problem of existing buildings, rather than with the design of new ones. And a leap it was. The ATC 28/FEMA 273 and 356/ASCE 41 product was something new in the field: analysis methods for realistically assessing how earthquake-resistant a building was, and how much protection engineering upgrading measures could provide for a "menu" of ground motion levels and associated probabilities, and for performance levels varying from just barely preventing structural collapse up to virtually making a facility earthquake-proof. It had the essence of performance-based engineering without using that jargon back then. And it was all there in the initial Phase 1 thinking.

**Morelli:** I can tell you that by the late 1980s, with the new buildings efforts under control, it just "felt right" to go on to existing buildings from my point of view. After all, as I have already said, that is the majority of the buildings that populate our daily lives. In any case, my recollection is that Phase 1 proceeded relatively smoothly from the management viewpoint, remaining generally on schedule and on budget. There was good participation in the workshop that was an integral part of the effort, with spirited discussions of some fundamental concepts, like engineering approaches to be used in seismic rehabilitation.

**Reitherman:** From being a worker bee on the first phase, the ATC-28 phase, and helping Bill Holmes, who was the lead for ATC, here is my recollection. Holmes was diplomatically forceful in inserting bold new ideas into the workshop, though he let an open consensus process work the ideas over. For example, instead of assuming that old buildings would be analyzed for resisting less intense shaking levels than were used in the design of new buildings, a traditional approach, he also put before the workshop the alternative of calculating the most realistic ground motions possible for the existing building case, and also realistically estimating performance by quantifying realistic capacities, rather than capacities pre-factored with safety margins, as was done for new buildings. There would have to be some compromise at the end of the process, being reasonable in a benefit/cost way about how much the existing building risk could be reduced. The old building couldn't be made as good as the one that was designed last week up to the current code. But the idea was to make the engineer see all the realistic facts all along the way.

**Morelli:** I agree that Holmes did a superb job, and so did you and the others. Examine even today the principal product of Phase 1: a concise and easy to use document, "Issues Identification and Resolution," that was organized deliberately along the same lines as the Steinbrugge "issues" document that preceded the formation of the NEHRP in 1977, of which I spoke earlier. Incidentally, it was during Phase 1 that the term "guidelines" gained the prominence that led to its adoption in the seminal document that was prepared in Phase 2.

**Reitherman:** A little more inside information on how Phase 1 worked. I've been to many workshops where the organizers expect great results to magically coalesce out of getting a lot of people together to talk, later extracting a "consensus" from the scribbled notes on flip charts. This was different. If you wanted to make a presentation with slides (overhead transparencies in that day), you had to request a five-minute slot on the agenda in advance. Multiple choice alternatives were well-defined, each with pro and con arguments. If you have an objective streak in you, it's not so hard to see an issue from more than one vantage point. If the group came up with a different idea on the fly, it could also be incorporated. "Consensus" wasn't what was written up weeks or months after the workshop but what was determined by actual voting. It was a miniature constitutional convention.

**Morelli:** Good characterization of the meeting. At the time I felt very good about it.

**Reitherman:** Much later, when the Consortium of Universities for Research in Earthquake Engineering (CUREE) had the job from NSF of establishing the organization that would serve the headquarters function for the Network for Earthquake Engineering Simulation, I used that same workshop format. The only difference was that by then, in 2002 and 2003, we had hand-held instant polling devices the audience used, with instant graphs of the preferences projected on a screen.

**Morelli:** I had occasion to use that kind of a hand-held device and it is neat, indeed. Anyhow, while Phase 1 was still underway, I had to turn my time and energy to "selling" Phase 2 to my not-very-well-disposed management,

to put it diplomatically. It did not help matters that the estimated cost grew from an initial \$3.5 million—my guess, I have to admit—to \$7.5 million, after the effort was fully scoped—a jump that my supervisors continuously reminded me of later on.

The sheer magnitude of the effort complicated matters further. Under FEMA internal rules, it required final approval by a board of eight or so members of the top agency managers that met only periodically. I remember still very vividly having to brief each member individually to obtain final approval of the project, because I had missed a regular session of the board and the available funds were about to expire in a few days with the end of the fiscal year.

At about this time, a new Administration and a new FEMA director took office, and my immediate supervisors also changed. Throughout the years at FEMA and with the ever-changing Administrations and personnel, my relations with immediate supervisors had varied, from distant and indifferent to close and supportive. However, now for the first time I felt distrust and hostility toward me on their part. I was perceived as being too aggressive in search of resources for my projects and not enough of a team player, for example, and of being too free-wheeling in my contacts outside the agency: too much of a free spirit, in other words. And my personnel evaluations of that period—the lowest in my whole long federal career—clearly reflected their attitude.

**Reitherman:** Around this time I visited you at your office. I'll note for the reader's benefit that at that time you were in the 500 C Street, Southwest, FEMA building in Washington. You didn't criticize anyone by name but

mentioned the burden of the new computerized personnel system that was continuously looking over your shoulder, making you insert numbers and text in categories that didn't make sense to you, as if it was going to increase your performance.

**Morelli:** Yes, it was a rather adverse working environment. Nonetheless, I embarked on the most ambitious single undertaking of my career, the Phase 2 effort, the preparation of guidelines for rehabilitating existing buildings.

## Developing Seismic Rehab guidelines

**Morelli:** The original contractual step was taken in the spring of 1990 with a request that I prepared, and FEMA formally issued, for private-sector organizations interested in participating in an effort that was described (surprisingly) as quite similar to what actually happened later. In response to this request and with as much informal facilitation on my part that was permissible under contract law, a consortium consisting of BSSC, ATC, and ASCE was created to prepare the guidelines themselves and also conduct extensive ancillary efforts essential for the successful completion of the undertaking.

In this arrangement, BSSC had overall responsibility for managing the effort, with Jim Smith at the helm. Without him, I doubt that the effort would have been completed at all, let alone on time and essentially on budget. ATC, with Christopher Rojahn as the principal investigator, and a core staff of about a dozen engineers, prepared the four contractually-required drafts (and countless others) and then the final products (after completion of a

long and at times contentious consensus review process). This core was augmented by some 100 volunteers, whose names read like a list of "Who's Who" of seismic design professionals of that time.

**Reitherman:** Some of the key leaders in the management meetings were Dan Shapiro, Bill Holmes, and Ron Hamburger. The key stumbling block, which of course is with us still today in some form, is the challenge of supplying both a large number of very precise numbers on a given existing building's properties and expected seismic behavior and also making all those numbers perfectly accurate. And this method had to be applied with older existing buildings, whose properties were often only poorly known.

**Morelli:** Yes, I saw that the project team was pushing ahead of then-accepted practice, but in retrospect, that was why the project was such a success.

Surprisingly enough, also in retrospect, it was BSSC, and not ASCE, that conducted the consensus review process. At this distance, the only plausible explanation to what appears to be an anomaly is the fact that ASCE had recently moved from New York to Reston, Virginia in the Washington area and had not yet established itself in its new venue.

By a stroke of what proved to be pure genius, BSSC and ATC picked Daniel Shapiro to be the project director. In one capacity or another, Shapiro had participated in all the projects that I knew of or was responsible for, starting with ATC 3-06, and continuing through the FEMA new buildings series, and the existing buildings undertaking, from the 1985 Tempe

workshop on. All the while he had founded and managed a prestigious engineering firm in San Francisco, California, responsible for the design of countless buildings that survived practically intact many earthquakes. Nonetheless, up to this time I had never really come to know him.

To my great privilege and pleasure, Dan took charge of the arduous task of creating the guidelines from scratch. I will always remember him in team meetings standing Solomon-like amid the (at times) heated arguments that took place between proponents of widely different approaches to all the tough issues confronting the creation of this new document. I am convinced that without Shapiro's strong leadership, knowledge, and constant drive the Guidelines would never have become a reality. He fully deserves the sobriquets of "Father of the Guidelines" and "Keeper of the Flame" that I coined for him.

**Reitherman:** And Dan is a great teacher, by the way. I took his evening U.C. Berkeley Extension class on lateral force design of wood buildings, and he taught with an engaging smile and a dry sense of humor.

**Morelli:** During the conduct of this effort, we suffered two grievous unexpected losses: the ATC Board Representative (Thomas Atkinson), and the head of the report preparation effort (Roger Scholl).

**Reitherman:** Roger was quite a guy. In a part-time role, he had fulfilled the executive director position for EERI in the late 1970s, back before Susan Tubbesing was hired. He was a long-time engineer with John Blume's firm. He had advanced ideas about what kinds

of ground motions caused damage to buildings. Roger worked on many ATC projects. He passed away before his time.

**Morelli:** BSSC received the formal permission and initial funding to proceed in the preparation of what became the guidelines in the summer of 1991, with the first task being the preparation of a detailed work plan, which was completed in the late spring of the following year. It called for the expenditure of some 60,000 hours of direct labor, a very high percentage of which represented ATC's efforts. The work plan proved to be surprisingly accurate. It hit the duration of the effort (about five years) and its cost (about \$7.5 million).

The cost estimate, however, caused me no end of trouble for quite some time inside FEMA, with some of my supervisors reminding me frequently of my gross underestimate (\$3.5 million). The only defense that I can offer even now is that I had no real basis for estimating the cost of a new and unprecedented effort like the production of the guidelines. I therefore took the cost of the ATC 3 project, as best as I could reconstruct it, added a factor for inflation, and reached my gross underestimate. In addition, many fundamental concepts and associated technical difficulties came into sharper focus as a result of the preparation of the work plan.

The plan was also an invaluable tool for Smith and me in managing this large effort, and my copy—now in the library of the University of Colorado-Boulder Natural Hazards Center, together with my other papers—also became rather worn by the time the guidelines were completed.

## Open Review Meetings

**Reitherman:** Open review meetings, attended by hundreds, also brought into the process a number of engineers who, if not given the chance to publicly take pot shots at aspects of the guidelines they didn't like, would have been on the sidelines ambushing the whole effort. Not everyone got what they wanted, of course, but once someone "put their fingerprints" on the document, even in a critical way, it tended to make them a party to the whole effort.

**Morelli:** That is a very good point, Bob. I remember taking a look at an advance copy of the twenty-five percent draft and, for the first time in this whole process, having doubts about its feasibility. Were the critics of my pushing for undertaking the preparation of the guidelines right after all? I had to wonder. My resolve to continue, however, was bolstered by my two towers of strength—Shapiro and Jim Smith. The effort continued and I never acknowledged my inner doubts to anybody. Fortunately, my management at FEMA was preoccupied by other matters at that time and paid scant attention to this effort.

As a matter of fact, by that time, I had a third tower of strength, on whom I came to rely more and more as time went on: Diana Todd, whom I had met at some earlier meeting. She was the new employee that National Institute of Standards and Technology, NIST, formerly the National Bureau of Standards, had selected to fill the vacant job of Secretariat to the ICSSC in 1990 or thereabouts. (Much more on the Interagency Committee on Seismic Safety in Construction later on.) Shortly after Todd's arrival at NIST, I started receiving memos and emails from her

containing parallel, balanced, and compound sentences, correct punctuation, and a vocabulary not usually found in seismic engineering communications—all that would easily pass an advanced English composition course at Harvard. I was at first perplexed, but when I finally met Diana Todd in person it all made perfect sense. She has a degree in English from Dartmouth, an advanced degree in engineering from the University of Colorado, and actual engineering design experience. With strong support from Wright, Todd quickly revitalized the functions of the Secretariat and the working of the ICSSC while applying her talents to the existing buildings efforts underway at that time.

**Reitherman:** Diana, in a meeting toward the end of the project, compared Dan to Jean Luc Picard, the captain in the *Next Generation Star Trek* television series, who wisely decided what needed to be done in a crisis situation and then calmly directed his staff to "make it so."

Her role for NIST was essentially to be a critic and find weaknesses in the guidelines that needed to be fixed, but she was also a good-humored diplomat. Some say there are two different fundamental styles in engineering and science, the male and the female, which must be accommodated and taken as important factors in their own right. But if you just took a transcript of the project meetings and tried to tell if the person named Todd was a man or woman, you might have thought she was an assertive male engineer who had been in practice for decades, not the young woman she was. And because of the fact that almost all the earthquake engineering experts in the country

as of the 1980s were male, she was usually the only woman in the room.

**Morelli:** With the coinciding of these mutual interests, it was not difficult for Todd and I to develop a very strong working relationship that benefited both of our agencies. In her relatively short career at NIST and then as a consultant to FEMA, she contributed many new ideas and approaches, and authored or co-authored many reports and papers as well as an Executive Order on existing buildings that we need to talk about later. She also provided the technical support that I needed, explaining otherwise abstruse engineering subjects with simple sketches and a few words. And she interpreted what were for me statistical conundrums, often starting with: “Now suppose that we had 100 black and 100 red marbles in a big glass jar . . .,” and ending with an easily understood clarifying explanation. Unfortunately for the program and me, she decided to leave the federal government toward the end of 2000. I will always be most grateful to her, however, for the many contributions she made while she was active in the program. So, very often when I say “NIST” in connection with existing buildings, in many cases I really mean Diana Todd.

### Development of Design Guidelines

**Morelli:** Now back to the development of the guidelines. There were undoubtedly countless technical topics that were raised, debated, some at length, and solved in the various committees. At the level of Shapiro and his few close advisors, however, there were only two very controversial ones that caused many hours of, at times, heated debate and which stick in my mind. One dealt with the fundamental design approach to

be embodied in the guidelines. Because of my lack of engineering background—and despite valiant efforts on the part of Todd to elucidate them for me—I have retained no details, let alone a rationale for the final approach that was adopted.

**Reitherman:** I think the controversy over the fundamental design approach was the constellation of new ideas I mentioned earlier that departed markedly from the practice for new buildings as of then: trying to compute numbers that realistically described building capacity, rather than enjoying the luxury of erring on the side of conservatism with the usual phi factors for new construction; using nonreduced ground motion levels; developing a menu of combinations of performance levels and earthquake levels/probabilities, rather than saying the goal was “life safety” (a redundant phrase as well as one only very vaguely defined in building codes).

If these engineering concepts sound ho-hum today, it’s to a large extent because of the seismic rehab guidelines project you launched. In 1995, the SEAOC Vision 2000 document was published, and it too embodied these sorts of concepts. That was also when PEER, the Pacific Earthquake Engineering Research Center, began to be supported for a decade to the tune of \$5 to \$6 million per year by NSF, the State of California, and access to a Pacific Gas and Electric Company tax on its ratepayers. “Performance-based engineering” became PEER’s motto, and it developed that concept considerably, especially in a detailed mathematical formulation. Later still the FEMA-funded ATC project called ATC 58, still in progress as of now, was making further attempts at making

the approach more quantitatively sophisticated. But the basic performance-based concepts were developed well before in your seismic rehab project.

**Morelli:** Glad to hear that. The second controversial issue that is stuck in my memory dealt with whether or not to include a simplified design approach for less complex buildings. The basis of the controversy was that the proposed design approach for buildings was quite elaborate, potentially discouraging its application, especially early on. Yet most buildings that need rehabilitation are not complex. The proponents hence argued for developing a more simple approach for less complex buildings, especially in regions of lesser seismicity, one that included some simplified prescriptive features. After much debate, the logic of their position eventually prevailed, especially after the first Users Conference strongly endorsed it, and such an approach was developed for inclusion in the guidelines as a separate chapter.

**Reitherman:** As I recall it, Chris Poland was the champion of including that simplified approach. In retrospect, if you look at what is by far the most widespread type of seismic rehabilitation to date in the United States, upgrading unreinforced masonry buildings, a simplified approach is the most common, requiring an engineer's calculations but also relying on prescriptive provisions.

**Morelli:** The effort finally came to a successful conclusion in 1997, with the publication of FEMA 273, after a short, but very intense consensus balloting process during which each major subsection of the guidelines and each chapter of the Commentary was voted upon by the BSSC membership, and all "no" comments

resolved. The result was a document that brought about as much progress in the field of seismic rehabilitation of existing buildings as ATC 3-06 did in the companion field of new buildings design some twenty years earlier. It represented the culmination of the effort started in Tempe, Arizona in 1985, building on all the yellow book reports and manuals on seismic rehabilitation that preceded it, but containing many novel features and design approaches from which design professionals could choose.

There were many engineering advances included in the guidelines, both in terms of the overall rehabilitation design of a building and in terms of components and materials. In my mind, however, the overarching advance is that the whole document is performance-based, a concept that had been slowly maturing for a few years and finally bloomed forth in this volume and its accompanying Commentary—an engineering first. The concept gave design professionals new and greater freedom to select from three carefully defined and described Performance Levels (Immediate Occupancy/Operational, Life Safety, and Collapse Prevention) and two Damage Ranges (Damage Control and Limited Safety) as starting points to guide their efforts from the very onset of the design process.

When combined with either a probabilistic or a deterministic seismic hazard, these levels and ranges then provided a rehabilitation objective for a building. To provide one combination of ground motion level and performance level, a Basic Safety Objective was defined, knowing that in many cases that would be the desired criterion. The concept was applicable to both

structural and, with some modifications, to nonstructural members. This greater freedom of design approach provided the professional with the information needed to discuss with prospective building owners and other interested parties a whole range of possible approaches to the rehabilitation of buildings to an extent not previously feasible.

Two additional major new features stick in my mind. A new set of seismic maps, prepared principally for a new edition of the *Provisions* by USGS, became also an integral element of the guidelines design procedures. The maps were based on data gathered by USGS in a truly nationwide effort to reach out to the geological and seismological communities and include them in the new map development process. The four analytical procedures defined in the new guidelines: a linear static and a linear dynamic and a nonlinear static and a nonlinear dynamic analysis procedure, are still the basic options today, whether for new or existing buildings.

The Seismic Rehab guidelines (FEMA 273) were part of a packet of four publications. The Commentary (FEMA 274) was prepared and published at the same time as the guidelines. As other commentary documents, like the one for the NEHRP *Provisions* for new buildings, it expands, clarifies, and enriches the information contained in the volume that it supports, and follows the same format and structure. Two more, a volume dealing with societal issues (FEMA 275), and another (FEMA 276) providing examples of how to apply the guidelines, followed in about a year or so.

**Reitherman:** A much earlier document, whose scope extended only to new buildings,

the SEAOC *Blue Book*, had the title *Recommended Lateral Force Requirements and Commentary*. Though the first edition was published in 1959, only in 1960 did the Commentary half get included, and to my mind, that was essential to its use by engineers. The commentary to the NEHRP *Provisions* similarly became a well-read textbook, essential to the use of the *Provisions*.

**Morelli:** FEMA 275 was different from most other publications in the series dealing with the seismic rehabilitation of buildings in that it was authored by a single individual, Robert Olson of Robert Olson Associates. Bob was selected principally for his experience as a practitioner of hazard mitigation at the state and local levels. As the first executive director of the newly formed California Seismic Safety Commission, he was instrumental in formulating and aiding the adoption of that state's basic earthquake policies, some of which continue in effect to this day. As a private consultant he continues to provide hazard mitigation plans and strategies at the local level and guide their implementation. The FEMA 275 volume first identifies a four-step iterative process that guides the decision-maker in determining the appropriate rehabilitation policy to adopt—including no action—in the light of local characteristics and situations.

FEMA 276 was the centerpiece of a concerted information dissemination effort started in 1999 and designed to lessen the reluctance—and in some quarters, downright hostility—to put into everyday practice the guidelines and the numerous concepts, design approaches, analytical tools, and similar features that were new at the time. In this “how to” manual, the

user could find an identification of the most common deficiencies and corresponding rehabilitation scheme for each of the model building types used in all existing buildings, with some variations dictated by the damage observed in the 1989 Loma Prieta and 1994 Northridge earthquakes. Major nonstructural elements were also considered. In addition, course materials were prepared and distributed and an extensive series of seminars and “train-the-trainer” sessions were held in about a dozen cities throughout the seismic areas of the country.

For some time I had been hearing more and more frequently that many basic engineering unknowns had been assumed to have been solved by “expert opinion” and many still remained to be addressed. These were therefore shaky foundations for proceeding further without a substantial amount of studies. When approached on this subject I was quite frank. While agreeing that not all problems had been solved, I believed that there was a sufficiently valid base to proceed to the next major program goal. That goal was to facilitate the transfer of the contents of the guidelines into an ANSI-approved document from which they would eventually diffuse into national and local buildings codes and standards.

### **FEMA 343**

**Morelli:** Nonetheless, as I did in connection with the Phase I effort that preceded the guidelines, I decided to try to address these reservations and calm these concerns by agreeing to a BSSC-proposed series of case studies to assess various aspects of the guidelines, even while the Example Applications volume

was still being prepared. This new effort was clearly a throwback to the Trial Design project of the early 1980s that studied new building seismic design provisions. The principal objective of this assessment document (FEMA 343) was to take the new analysis and design approaches of the guidelines and determine if the resultant seismic rehabilitation design was rational, met the selected performance levels, and provided the user a deeper understanding of expected building seismic performance—all compared to then-current and prevailing local codes and practices. Further, an assessment was to be made as to the user-friendliness of the guidelines. Lastly, costs of the designs resulting from the guidelines were to be compared to typical costs contained in the latest version of FEMA 156.

**Reitherman:** That is a very ambitious set of goals for one study. How did it go?

**Morelli:** It was very rough at times. The obstacles to a successful conclusion turned out to be not so much engineering in nature, but organizational and administrative. There were several problems, but two stand out in my mind as particularly vexing. One was the selection of local designers—they had to be representatives of the various potential users of the guidelines in training, knowledge, and practice, as well as typical of local designers. This meant that a large majority had barely heard of the guidelines, let alone were familiar with the technical contents. They therefore had to be “coached” on many design issues just far enough to proceed, but not too far, lest it would not otherwise be possible to assess how understandable and usable the guidelines were.

The other obstacle was the selection of the buildings to be used. One methodology would have been for the study team members to make the selection on the basis of their knowledge of the building stock of various communities. It was soon realized, however, that it was not possible to fully camouflage the identity of the buildings. Once the assessment was published, owners would claim irreparable economic loss, resulting from their buildings being identified as seismically deficient, and sue for large compensations. As it turned out, that dilemma was easily solved at the suggestion of a member of the team, whose identity I do not remember: we would select the vast majority of buildings from those that had already been identified as being seismically deficient in a separate study that was conducted in compliance with a Congressional mandate and Executive Order 12941 (much more on this effort in the next chapter).

By far the most significant result of the project was the determination that the guidelines document, with some exceptions, was technically sound and furthermore resulted in designs that achieved the desired building performance. On the other hand, the guidelines were found to be more difficult to use than code documents, especially in regard to phraseology and computations—to me, understandably so, because the guidelines were (on purpose) structured to resemble more the final report of a study or a resource document than a set of code provisions. Not surprisingly, the design and construction costs of buildings that followed the guidelines were higher than those of buildings that followed local ordinances. In my judgment, the effort identified no grounds for changing my plans to get the guidelines into

the mainstream of national codes and standards nor that it was premature to do so.

Even before FEMA 343 was completed in the fall of 1999, I took the first steps to start on the road toward getting the FEMA-funded work into that mainstream. I immediately encountered a major obstacle, however. Up to that point, the consensus mechanism for documents dealing with both new and existing buildings had been BSSC, which to this day is not an ANSI-certified standard-setting entity, as I said earlier. Engineering advances dealing with new buildings and contained in documents that had passed the BSSC consensus process, however, were rather quickly digested and incorporated into national codes—and thereby applied in the real world—only because of the existence of ASCE 7, *Minimum Design Loads for Buildings and Other Structures*,<sup>29</sup> and other similar documents. By this time, ASCE was a certified standard-setting organization.

The obvious solution was the creation of a resource document for existing buildings (like the *Provisions* for new buildings) that ASCE hopefully could develop into an ASCE 7-type document in accordance with its own ANSI-accredited procedures.

There was no question in my mind that that there was only one organization that had both the capability of assembling the talent required by this effort and the ability to facilitate the creation of an ANSI-approved document most expeditiously: ASCE. A supportive contracting

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29 ASCE 7 has been updated and republished every few years, and carries legal weight because it is incorporated into the model building code in the U.S., the International Building Code.

officer and a contractual instrument in the federal procurement process—a Cooperative Agreement—that permits a rather rapid process and some leeway in the selection of a contractor, hastened the initiation of the effort.

Getting it underway quickly, however, was the work of Thomas McLane. McLane had joined ASCE not long before the preparation of the guidelines started. We formed a partnership that greatly benefited the existing buildings program during my years of tenure and that has continued ever since. We became and remain friends. Later, McLane moved over to ATC and ran its Washington-area office.

## FEMA 356

**Reitherman:** Taking up the topic of FEMA 356, do you mind recollecting why it was controversial at the time?

**Morelli:** My move to start the preparation of a new document that eventually became FEMA 356, was the move that caused the storm that for some time had been forming in the seismic engineering community to break and quickly reach very high intensity: a three-and-a-third-page letter from the Chair of the BSSC Board to Michael Mahoney, who was at that time acting head of the FEMA earthquake program. As the letter recounted, concern about my move was being discussed with considerable angst and at some length by the ATC Board of Directors as early as the latter part of 1997. Late that year, Chris Rojahn, ATC's executive director, wrote to Jim Smith to convey the ATC Board "sentiments" that my move was premature and most unwise, the guidelines being "untested" and susceptible to prematurely becoming a

legal requirement, "particularly in California." The BSSC Board took up the matter with dispatch and made it a topic of considerable scrutiny and deliberation for several months. It essentially reached the same conclusions as the ATC Board had. That information was unofficially provided to me by Smith, but my plan remained unchanged.

By this time (early 1998), as the letter goes on to recount, the ATC Board had somewhat modified its position on the matter—accepting the inevitable, I guess—and was insisting only that the persons responsible for the preparation of the guidelines "must have the responsibility" for changes contained in the new FEMA 356. Without my knowledge, Jim Smith tried to resolve the matter in a phone conversation with Mahoney, but, to his great credit, Mahoney told him to put the matter in writing, which BSSC did. The resultant letter closes with a long prediction of dire consequences for FEMA if my effort were to proceed as planned, including lack of acceptance and adoption of any ASCE standard and "call[ing] into question other...programs fostered by FEMA."

Frankly, I was stunned by the dire tone of the letter and hurt by the fact that I was not told of its coming, in spite of having worked with both the ATC and the BSSC boards for over twenty years. It struck me as an equal mix of an undoubtedly sincere concern on the part of the seismic engineering community, but not completely devoid of equal concern for the appearance of a third strong competitor for FEMA business besides ATC and BSSC: ASCE. For the existing buildings program, the latter concern proved to be well founded, incidentally. BSSC worked on none of my efforts after the

guidelines, a situation undoubtedly abetted by the coincidence that Jim Smith soon thereafter retired for personal reasons, and my relations with his short-tenured successor started poorly and deteriorated very fast.

The preparation of the FEMA 356 document was an entirely novel undertaking in the existing buildings program. What to call the document engendered considerable discussion from the very start. This was a federally sponsored product, so any term that could possibly be misinterpreted or misrepresented as an attempt by the federal government to impose a national building code was out of consideration. The U.S. Supreme Court settled that matter in two well-known and still standing cases in 1924 and 1925. A similar problem was faced in the preparation of FEMA 310, also under way at that time, that I will discuss later. A new term was therefore needed for both documents. I believe it was McLane that found it in the lexicon of ASCE (“Prestandard”), denoting a document that provides a basis for the development of an actual standard according to ANSI-approved procedures.

Staffing was relatively easy. McLane recruited essentially the same individuals that created the guidelines, if for no other reason, because the required skills and experience could be found nowhere else. This decision provided further proof—if any were needed—that the ATC and BSSC concerns that I just discussed turned out to be the proverbial tempest in a teapot. Team leadership, however, passed to Chris Poland, with “Keeper of the Flame” Shapiro nonetheless continuing to play a very significant and vital role.

Poland had undoubtedly participated earlier in other projects of mine, but he first came to my attention at the meeting at Arizona State University in Tempe back in 1985 that was run by the ABE combination of ATC, BSSC, and EERI. I still remember very vividly the circumstances. Instead of floating among the various breakout groups, I never went further than the session that dealt with engineering topics. The reason was that Poland had essentially taken over the session by presenting forcefully and persuasively a logical progression of efforts that needed to be undertaken to create the engineering portion of the new program on the seismic safety of existing buildings. When the final version of the first strategic plan for this new area of activity was completed it captured most of the efforts that he had proposed in that session.

In the strong and well-known culture of mentoring that prevails to this day in the firm that bears his name, Henry Degenkolb must have personally selected and groomed Poland to eventually be his successor. Events have proved Degenkolb’s instincts to be right on target, with Poland in fact deservedly (in my opinion) becoming president and CEO of the firm several years ago. In spite of that heavy responsibility, however, Poland played an increasingly significant role in the existing buildings program, leading several key projects and actively participating in others. His ability to constructively address criticisms of the guidelines and, as chair of the ASCE Standards Committee on the Seismic Rehabilitation of Existing Buildings, to bring about consensus was remarkable.

**Reitherman:** You didn’t know this, Ugo, but we wouldn’t be doing this oral history of yours,

and the others in the series over the past several years wouldn't have been produced, if it weren't for the way Chris gave me quick executive approval while he was EERI President to take over management of the oral history program established by Stan Scott, when Scott died in 2002.

**Morelli:** Sounds like the same Chris Poland I have just been describing. Now back to FEMA 356. As would be expected, FEMA 273 and 356 share fundamental concepts and approaches, such as performance-based concepts, performance levels, and building types, as well as basic engineering tools like computational methods and numerical values for the same topics. FEMA 356 was completed and published without undue complications by the end of 2000 and started its official (and tortuous) journey toward eventually becoming ASCE 41 in 2006, after I had retired.

## FEMA 357

**Morelli:** FEMA 357 was published along with FEMA 356 in 2000. It tried to collect the major outstanding issues that had surfaced after the publication of the guidelines, and document the manner in which they were being resolved, if feasible, during the preparation of FEMA 356. It was another attempt to make preparation of the guidelines as transparent as possible—we wanted to win over at least some of the opponents of how the program on existing buildings was proceeding and its fast pace.

FEMA 357 was different from all the other volumes published by this program in that it was essentially historical in nature. First of

all, it catalogued the research requirements and knowledge gaps identified by BSSC at the completion of the guidelines. Secondly, the volume collected the major weaknesses of the guidelines that had come to light when some of the larger and more progressive design firms had started to use it in their daily work. (Most smaller firms and individual professionals tended to shy away from applying anything as new as FEMA 273.)

Such weaknesses included: lack of clarity of some procedures, gaps in necessary coverage, doubts about results of applying portions of the methodology. A third portion of FEMA 357 consisted of some seventy or so areas in which FEMA 273 needed improvement, as identified by the FEMA 343 case studies. As these weaknesses were identified, they were screened and, if necessary, subjected to short concentrated study, with the results becoming part of the FEMA 356 preparation. Although at the time it seemed that FEMA 357 was an absolute necessity, in retrospect I now have considerable doubts as to its usefulness—a topic for a future historian to consider and decide.

## ATC 14, FEMA 310

**Morelli:** In the late 1990s, shortly before FEMA 356 and 357 were started, another major effort got underway to prepare what became FEMA 310. Its progenitor was the NSF-sponsored ATC-14 that I mentioned earlier. The two key concepts that stem from ATC-14, namely the use of a series of statements the engineer had to answer “true” or “false” to concerning a given building's characteristics, and the sixteen Model Building Types have survived to this day, with some

modifications, of course. FEMA 178 survived a rather intensive consensus review by BSSC, during which both substantive changes and additions were made. Rapidly thereafter, it gained broad acceptance by the engineering community and was put to extensive use. In short order, it became a *de facto* standard in this country and, with modifications, a *de jure* standard in Canada—a first for a U.S. earthquake engineering document. It also was the starting point for FEMA 310.

**Reitherman:** Let’s give the reader an example of a true/false item on the list. For a concrete Model Building Type, the statement would be that the calculated shear in psi for a particular type of concrete element was at least up to a specified threshold level. A “true” answer meant that potential deficiency did not exist; if there were a lot “false” answers, it indicated the need for seismic rehabilitation. But it also indicated with commentary and illustrations why a “false” answer indicated a vulnerability, with examples of past damage. Again, commentary was essential to make the document useful, as with the earlier cases of the SEAOC *Blue Book*, whose title clearly spelled out the importance of commentary—*Recommended Lateral Force Requirements and Commentary*—and also in the case of ATC-3.

**Morelli:** Your true/false example nicely illustrates how FEMA 178 worked, and with regard to commentary, I became an advocate of including the explanatory material right in the body of documents where the requirements or provisions were given. In organizing the management of FEMA 310, ASCE made a determined and successful effort to expand the core of veteran experts such as Shapiro and Poland,

with some much-needed newcomers, some of whom, interestingly enough, were rather vocal critics of FEMA 273. That was especially true of the Project Steering Committee. As in the case of FEMA 356 (discussed earlier), the term “Prestandard” was adopted.

From the technical point of view, FEMA 310 had a very distinguished lineage, hence a solid and broad base on which to build. FEMA 310 introduced more rigor into the screening processes with the use of three “tiers” of analysis. With each successive tier, more stringent analytical methods identify additional buildings that do *not* require rehabilitation.

**Reitherman:** Something like a doctor ordering an additional test if one kind of diagnosis indicates a problem, rather than immediately saying surgery is needed?

**Morelli:** Exactly. The tiered approach ensured that the initial screen did not select too many buildings and prematurely indicate they all needed rehabilitation. Further, checklists for buildings located in medium and low seismicity areas were much expanded and clarified. Eventually, FEMA 310 became ASCE 31 and FEMA 356 became ASCE 41. The hand-off from federal to private hands was seamless and hardly noticed, even by active participants. At the time, I could hardly believe this process was really happening, but it did.

What made feasible this rapid advance was the fact that ASCE, which was leading the preparation of both FEMA documents, also had in place (unlike BSSC) a long-standing process for producing ANSI-approved voluntary standards that were widely used in nationally-applicable building codes. In addition, this

smooth transformation into ASCE documents was aided by the roles played by two key members of the project teams, as I've described: Chris Poland, as principal investigator of the efforts as well as chair of the ASCE Standards Committee mentioned above, and Tom McLane, as ASCE project manager of the same efforts.

### FEMA 412, 413, and 414

**Reitherman:** FEMA 412, 413, and 414 are different than the other FEMA earthquake program guidelines you've mentioned, because they were aimed not at the engineering audience but rather the construction industry.

**Morelli:** I had been approached informally about undertaking such a project sometime earlier—I have forgotten the exact year—by construction association members who were participating in one of my projects. At the time, however, I was preoccupied with several important efforts that were already underway and stretched to the limit in funds, so I stalled them. The association is the Vibration Isolation and Seismic Control Manufacturers Association (or VISCMA), which encompasses a substantial number of producers of a large variety of subsystems and components—truly grassroots and neglected members of the seismic community.

When the VISCMA top management next approached me with an unsolicited proposal, they had defined clearly their needs and offered a cost-sharing (in kind) scheme that lessened the financial burden to FEMA. Furthermore, they had acquired a strong endorsement by ASCE. Under these changed conditions, I saw no reason to demur further. The

effort produced three manuals, FEMA 412, 413, and 414—one for mechanical equipment, one for electrical equipment, and one for ducts and pipes. In very simple and direct language, they provided step-by-step instructions on how to seismically install the major pieces of equipment, down to the types of most suitable screws.

The practical knowledge was provided by the participants of three focus groups of trade persons who arrived for the most part in trucks and SUVs straight from the job sites—which I thoroughly enjoyed monitoring. The final product was a pocket-size manual, printed on thick laminated paper, with colors used extensively for both process tracking purposes and to attract the reader. The FEMA Publications Office—shocked at first by all the special requests—deserves a special word of thanks for discovering novel ways to satisfy the requests as well as agency regulations. I understand from my former colleagues that the manuals have proved to be very popular.

**Reitherman:** Currently, in the revision of FEMA 74, *Reducing the Risks of Nonstructural Earthquake Damage: A Practical Guide*, the first several editions of which considerably predate the FEMA 412-414 series, some HVAC-related material is being drawn from those trade-oriented documents and they are recommended. The illustrations in the FEMA publications are quite clear.

### Incremental Seismic Rehabilitation

**Morelli:** Another area that the program expanded into was incremental seismic rehabilitation. The key tenet of this approach states

that the rehabilitation of a building in discrete stages is feasible and safe to undertake, rather than all at once, if resource constraints or other circumstances dictate that it be done that way. Based on some NSF-sponsored research on the subject and with sponsorship by a FEMA colleague, Marilyn MacCabe, David Hattis of Building Technology, Inc., and Frederick Krimgold of Virginia Polytechnic Institute produced a manual on how to apply the concept to K-12 school buildings sometime in the late 1980s. I understand that the volume enjoyed some success at the time that it was produced, but was not widely applied.

My personal conviction was that the concept made eminent practical sense and nobody had challenged it on engineering or safety grounds. Further, the usual sources of new knowledge—research, recent earthquakes, and the like—had produced some pertinent results. So when the Hattis-Krimgold team submitted

an unsolicited proposal to undertake work on this subject, I was favorably disposed toward it. The scope of the project was greatly expanded to include not only an updated version of the school manual, but also similar manuals on five additional occupancies: hospitals, office buildings, multi-family apartments, retail businesses, and hotel/motels.

With FEMA 310 and FEMA 356 on their way to becoming ASCE standards—another first—the long journey toward making existing buildings more earthquake resistant that started back in 1984 and 1985 with laying out a strategy in Tempe, Arizona, came to an end for me when I retired. As I look back on my years with that effort, I see that much had been accomplished by then, especially in the engineering design and construction arena, but much less than was needed in the societal and political arenas—alas.

**TABLE 3.**  
**SELECTED FEMA EARTHQUAKE HAZARDS REDUCTION**  
**PUBLICATIONS ON EXISTING BUILDINGS**

FEMA 154	<i>Rapid Visual Screening of Buildings for Potential Seismic Hazards: A Handbook</i>
FEMA 156	<i>Typical Costs for Seismic Rehabilitation of Existing Buildings Volume I: Summary</i>
FEMA 172	<i>NEHRP Handbook of Techniques for Seismically Rehabilitating Existing Buildings</i>
FEMA 174	<i>Establishing Programs and Priorities for the Seismic Rehabilitation of Buildings: A Handbook</i>
FEMA 178	<i>NEHRP Handbook for Seismic Evaluation of Existing Buildings</i>
FEMA 255	<i>Seismic Rehabilitation of Federal Buildings: A Benefit/Cost Model, Vol. 1: A User's Manual</i>
FEMA 273	<i>Guidelines for the Seismic Rehabilitation of Buildings</i>
FEMA 310	<i>Handbook for the Seismic Evaluation of Buildings: A Prestandard</i>
FEMA 343	<i>Case Studies: An Assessment of the NEHRP Guidelines for the Seismic Rehabilitation of Buildings</i>
FEMA 356	<i>Prestandard and Commentary for the Seismic Rehabilitation of Buildings</i>
FEMA 357	<i>Global Topics Report on the Prestandard and Commentary for the Seismic Rehabilitation of Buildings</i>
FEMA 395–400	<i>Incremental Seismic Rehabilitation</i> (5 volumes on different occupancies and one on engineering considerations)
FEMA 412	<i>Installing Seismic Restraints for Mechanical Equipment</i>
FEMA 413	<i>Installing Seismic Restraints for Electrical Equipment</i>
FEMA 414	<i>Installing Seismic Restraints for Duct and Pipe</i>
FEMA 547	<i>Techniques for the Seismic Rehabilitation of Existing Buildings</i>

# Federal Buildings

*Besides the private sector component to the seismic safety of the built environment, there are the over 450,000 buildings that the federal government owns. . . .*

**Reitherman:** You've talked tangentially a few times about the separate but related track that seismic provisions for new and existing federal buildings were on. Expand on that, please.

**Morelli:** The topics I have discussed to this point have emphasized private-sector activities. Besides the private sector component to the seismic safety of the built environment, there are the over 450,000 buildings that the federal government owns and the many more that it leases or in the construction of which it is financially involved.

Departments or agencies with large building inventories have traditionally developed and enforced their own seismic building provisions. The two that come immediately to mind are the DOD Tri-Services Manual, *Seismic Design for Buildings*, first published in 1966, and the VA construction manual. The latter was developed immediately after the 1971 San Fernando earthquake and contained

some of the most stringent earthquake requirements in effect at that time. Agencies with smaller inventories tended to prescribe the use of model building codes being enforced in the locality in which the construction occurred. In both cases, knowledge from the public-sector activities in earthquake safety tended to diffuse into the comparable activities in the federal sector. This diffusion process was facilitated by the participation of federal employees in code development work being conducted at that time by organizations like BOCA (Building Officials Code of America) and by others. Absent, however, was a federal government-wide legal framework for protecting federal buildings from earthquake hazards.

**Reitherman:** We should pause for a moment and remind the reader that federal buildings are exempt from local building codes—the only provisions that apply to them are the ones the federal agency applies to its own buildings, either by its own regulations or by a regulation that spans over the federal agencies.

**Morelli:** Yes, and with the exception of the Department of Defense and the VA, federal agencies weren't adopting their own definitive seismic regulations at this time.

### **Interagency Committee on Seismic Safety in Construction**

**Morelli:** The situation started to change in the mid-1980s, thanks mainly to the efforts of Richard Wright, whom I mentioned earlier. Wright had long been active in seismic engineering endeavors, first as a professor at the Urbana-Champaign campus of the University of Illinois, where he had earned his Ph.D. under Nathan Newmark, and continued later as the head of

what is now the Building and Fire Research Laboratory of NIST, at the time when NIST was called the National Bureau of Standards. Since shortly after Chuck Thiel left FEMA, FEMA had delegated the chairmanship of the ICSSC, the Interagency Committee on Seismic Safety in Construction, to the Bureau of Standards. Wright was designated ICSSC Chair by his agency, and held that position until he retired in early 1999, working very diligently and tirelessly to ensure that the ICSSC played a very active and productive role in the area of seismic safety of federal buildings. The earthquake program owes him a large debt of gratitude for all his efforts not only as an effective chair of the ICSSC, but also as an educator of a generation or two of earthquake engineers and researchers, and an able manager of the NIST Laboratory.

As mentioned earlier, Chuck Thiel caused the ICSSC to come into existence shortly after the birth of the NEHRP, but the organization has evolved considerably since those days. Because of heightened awareness and interest in earthquake mitigation on the part of the agencies, membership had grown to over thirty departments and agencies, while eligibility remained unchanged over that time span.

**Reitherman:** In the 1990s on one of the several panel reviews of the NEHRP program, my task was to interview all of the ICSSC agency representatives—I think about twenty or more then. It was daunting just to line up interviews and find these people. Some agencies owned a lot of buildings, some just provided financing that triggered their ICSSC involvement, some had people on staff with earthquake engineering expertise, many didn't. Just corralling the key person from each agency and getting them

to meet as a formal federal committee must have been an accomplishment.

## Executive Order 12699 for New Buildings

**Morelli:** It was, but Richard Wright had a way of motivating people to participate. Over time, each ICSSC organizational level had evolved to function as any other body in the private sector that deals with matters pertaining to engineering and construction codes, namely: written procedures; circulation of drafts among members and of their responses; resolution of negative answers that are found persuasive; reaching consensus on as many issues as possible; and recommendations by the chair to the next higher level, including identification of any remaining unresolved issues. The major ICSSC products consist of technical and “how to” reports, and of Recommended Practices (RPs). RPs are not binding on the agencies, but often become *de facto* agency codes and, over time, have served at least two significant functions in the improvement of seismic safety of federal buildings: a ready source for the agencies of up-to-date seismic engineering information (derived directly from the FEMA manuals and reports) and a tool to effect a measure of uniformity on engineering and construction matters among them without infringing on their prerogatives.

The first ICSSC document to have a real impact on the construction agencies was the Executive Order (EO) on new federal buildings finally issued in 1990.

**Reitherman:** What are EOs, as distinct from laws passed by Congress?

**Morelli:** Executive Orders, EOs, are directives issued by the president to the federal establishment and have the force of law. They are promulgated for a variety of reasons, but very often to make more explicit the intent and provisions of a law passed by the Congress and to assign responsibility for carrying out the law to agencies in the Executive Branch—this is just a working definition of an EO. I do not recall exactly when the preparation of the EO on the seismic safety of new federally owned buildings and of federally leased, assisted, and regulated buildings was started, but it was sometime in early 1984. Richard Wright was the person who originated the idea and worked doggedly to get the final product eventually signed by President George W. Bush in 1990.

The intent of the EO was to bring the seismic safety of new federal buildings in line with the private sector by the time the first edition of the *Provisions* on new buildings would become available (1985). Thus federal construction would not add to the large inventory of buildings vulnerable in case of a damaging earthquake in this country. The EO preparation took six long years, however, stretching from sometime in early 1984 to the final signing date, January 1990, and by that time the third edition of the *Provisions* had been completed.

There were several major reasons for this delay. First of all, there was the question of scope of the EO, namely: should it cover new buildings only, new and existing buildings, or new and existing buildings and lifelines (infrastructures)? Initially it was decided to adopt the broad coverage. Then the usual concerns by agencies about encroachments, real or imaginary, on their construction turf had to

be eased. Provisions were therefore inserted in the draft EO, such as there would be no retroactivity of the provisions, no diminution of standards already in place, provided they were at least as stringent as those called for by the EO. It gave authority to the agencies to issue regulations to implement the EO, thus providing some leeway in interpreting the EO on their part.

The next reason for the delay was both a blessing and a curse: the involvement of the policy-making (political appointee) level in the process in the affected agencies. The blessing was that it gave some assurance that the EO would be supported and, if issued, would in fact be implemented—which is not always the case with EOs, in spite of the fact that they are supposed to have the force of law. The curse was that officials at this level of agency management are generally engaged in so many other pressing topics that it is often difficult to get their attention on a matter—always a common situation. Finally, the very nature of the consensus process requires time.

Incidentally, in FEMA the political appointee that played a very active role on this EO was a Deputy Director (one level down from the agency head), with me as an intermediary to the ICSSC. On a personal level, as the FEMA representative on the ICSSC, I was often caught between FEMA's agency-stated interests and my broader concerns for improved seismic safety—but I had to be a good soldier, try to steer the FEMA position as much as possible toward stronger measures, but at the end had no choice but to present and vote the FEMA position. This was true for a number of other agency representatives who were

advocates of strong effective earthquake mitigation policies, but were held back by their agencies.

As I recollect, by the end of 1984 several drafts had already been circulated for comments to subcommittee members and a version approved for handing to the Full Committee for its consideration. A complete version went to the member agencies for concurrence only in the middle of 1985.

In FEMA the draft hit a bump at that point. Up to then, only my management chain up to the Deputy Director responsible for earthquake activities and I had participated in reviews of the various EO drafts. To get the FEMA Director to approve the ballot (an ICSSC requirement), however, it was first necessary for all major segments of the whole agency to concur. The segment responsible for providing assistance immediately after a declared disaster (Public Assistance) insisted that work done on damaged but repairable buildings (covered as financially assisted buildings) be excluded from the proposed EO. Fiscal restraint was their argument, rather than mitigation of earthquake risks that I championed, but they prevailed. The internal FEMA wrangling went on for several months, however. As a result, the long-delayed FEMA ballot contained a suggested addition to the EO that eventually was incorporated in the final version as a separate subsection (3.d.). This subsection excludes from the purview of the Executive Order emergency work, temporary housing assistance, and individual and family grants to victims of disasters. New construction after a declared disaster, however, is explicitly

identified in the same subsection as being covered by the EO, in a clause that I inserted.

Hard to believe, but the rest of 1985 and first half of 1986 were taken up by a series of changes requested by other member agencies. The changes did not really alter either the basic concepts embodied in the draft nor the fundamental structure, but were substantive enough to require many time-consuming agency ballots, which very often took twice as long as scheduled.

In the summer of 1986 FEMA, as the then-lead agency of the NEHRP, officially received an ICSSC-approved draft EO for final processing prior to transmittal to OMB, the entity in charge of final approval of all EOs at the federal level. At that point the FEMA Office of the General Counsel raised some legal objections—none of a substantive nature—that required further time to overcome. Consequently, the draft EO was not transmitted to OMB until the late winter of 1987—a full three years after work on it had been started.

## OMB Requires Cost Data

**Morelli:** I am sure that OMB performs a very valuable and needed function in the executive branch of our government, namely to ensure that federal agencies adhere to and implement the policies, fiscal and otherwise, of the administration in power at the time. As a political scientist I applaud its existence. As a low-level functionary championing seismic mitigation, however, I hated OMB's narrow-minded propensity to give undue (to me) weight to fiscal restraints in considering all problems, at the expense of other dimensions and needs. OMB reacted typically to this draft

EO by asking how much it will cost. And it took more than six months (until August 1987) to communicate its decision to FEMA, and then not making at all clear the type and extent of the cost data that it was requesting.

Cost data on new buildings were available, having already been compiled during the trial design effort made in connection with the first edition of the *Provisions*, as I discussed earlier. Further, an effort was underway to gather data on existing buildings, but there were no data on lifelines. The initial position of ICSSC members was to hold firm for inclusion of all three types of construction in the EO, as I said, but gradually (and reluctantly) a more pragmatic solution was championed by FEMA and finally adopted—namely to narrow the scope of the draft EO to new buildings for which defensible cost data existed. A new version of the draft EO had to be prepared along those lines by Wright, approved eventually by the ICSSC, and forwarded to FEMA, which in turn sent it to OMB in early summer of 1988. A memorandum summarizing the available cost data and emphasizing the relatively small cost impact accompanied the draft.

It seems incredible, but the processing of the draft EO took almost another year and a half before the effort came to fruition. By then the 1989 Loma Prieta earthquake had occurred (and had been widely televised), rudely awakening the nation from its lack of concern about the consequences of seismic events in a heavily urbanized area (into which it lapses between major events). The pace of the final processing by OMB—concurrence of the affected agencies of the Executive Branch, including that of the Department of Justice, which has a

last look at all EOs—quicken. Nonetheless, by that time a new Administration (George Bush, the father) had taken office in 1989, and it insisted on a review of all draft EOs left behind by its predecessor, Jimmy Carter, thus interjecting yet another delay in the process. Finally EO No. 12699, was signed on January 5, 1990 and issued. Incidentally, some say that without the Loma Prieta earthquake that happened a little less than three months earlier, it would never have seen the light of day—and they may well be right

## Implementing the Executive Order

**Morelli:** The Executive Order’s coverage is quite all-encompassing. It includes: all federal buildings designed and constructed after its issuance; buildings which are leased for federal use; buildings for which the federal government provides any type of financial assistance (including mortgage insurance, for example); and buildings for which the federal government issues any regulation of structural safety. The last category was included, quite frankly, to ensure that no type of building was left out—it is a “catch-all” phrase. The Executive Order requires the use of private-sector building standards whenever possible. In addition, it contains the FEMA-sponsored provision excluding disaster emergency or assistance work and the administrative procedures intended to ensure that the Order is implemented.

Subcommittee 4 of the ICSSC (responsible for leased and federally insured buildings) prepared detailed instructions for agency use on how to satisfy the requirements of the Order.

The most significant issue it resolved was in regard to which building code should the agencies use in implementing the Order. On this point of “equivalency” of code provisions, the Subcommittee established a procedure that survived at least until my retirement and may well continue to this day. It determined that the seismic safety levels of the latest version of the *Provisions* for new buildings be the standard and that a study be made to determine which model codes provide an “equivalent” level of seismic safety. At that time the then-current versions of the UBC, BOCA, and SBCC model building codes were all determined to be equivalent and therefore adequate for agency use. As noted earlier, subsequently, by 2000, those three model codes had merged and had issued a single model code, the International Building Code.

Subcommittee 4 recommended other implementing rules, notable among them was the appointment by each agency of a “Seismic Safety Coordinator” to manage all aspects of the implementation of the Order and otherwise act as a focal point on earthquake-related topics in each agency. On the basis of these Subcommittee 4 recommendations, a Recommended Practice (RP) on how the agencies should implement EO 12966 was co-edited by Diana Todd, balloted according to ICSSC procedures, and published in 1992 as RP 2.1-A. RP 1, issued a few years earlier and also covering new federal buildings, represented a blend of design approaches contained in the most widely used codes of that time, UBC, ANSI 58, and SEAOC’s lateral force requirements, as well as the newly-available *Provisions*.

To this day, implementing regulations have not yet been prepared, let alone issued by any agency, in spite of a re-enforcing provision of P.L. 101-614 (that I will discuss shortly) tasking the president to issue such regulations by February 1, 1993. Nonetheless, my general impression is that the EO was beneficial in bringing about seismic mitigation in many areas of the country, although it was applied with unequal vigor from one agency to the other, and even from one region to the other in the case of FEMA. It often set an example of seismic safety in new construction especially in locations where the hazard is not high and awareness of the risks equally low. Up to the time I retired, I believe that this EO continued to serve a useful purpose, as all of us who worked on it hoped it would. All the struggles that went into its preparation were not therefore in vain.

Shortly after the issuance of the EO, I prepared and published a management plan on how FEMA should go about implementing it, but it was never published, let alone put into practice. In the spring of 1990, overall responsibility for this EO in FEMA was—mercifully—transferred to a colleague. Because of the pressure generated by all the other existing buildings activities going on at that same time, all I could maintain was a sentimental interest in it.

### **Existing Federal Buildings: Executive Order 12941**

**Reitherman:** You must have felt like you had run a marathon to get the EO on new federal buildings enacted, but then you set off on another twenty-six miles in pursuit of an EO for existing buildings. Maybe we should say

another two or three marathons because existing building issues are more complex than for new construction.

**Morelli:** That process had its origination in 1990 also. Three reports had a common origin in Section 8 of the law that the Congress passed in the fall of 1990 to reauthorize the NEHRP, namely P. L. 101-614. Section 8 (the author of which is unknown to me) seemed to be the answer to a dream that some of us activists for more earthquake safety of existing buildings had had for some time. The first paragraph of this Section 8 covers buildings constructed for or leased by the federal government. For these two categories of buildings, the president was to issue standards for “assessing and enhancing”—evaluating and rehabilitating—them by December 1, 1994. The ICSSC was specifically charged with developing such standards, thus attaining legal status by legislation after over a decade of *de facto* existence, although it had been recognized already in the previous January in EO 12699. The second paragraph of Section 8 requires the president by the same deadline to report to the Congress on how such standards could be applied to financially assisted buildings and to buildings the structural safety of which are regulated by the federal government—the same catch-all phraseology we had inserted in EO 12966. (Such a coincidence!) EO 12941 was issued in December of 1994 by President William Clinton.

For a few months after the law was passed, we waited in vain for signs of a move on the part of OMB or other segments of the Executive Office of the President to issue some guidance document on how to implement this Section 8

of the new law, as generally happens after new Executive Branch actions are required by legislation. When none materialized, and with the clock ticking toward the December 1994 deadline, FEMA and NIST/ICSSC took action.

An informal task force of FEMA, NIST, and other key ICSSC members considered several options for an implementing document, narrowing them down to a memorandum to federal agencies from the Director of OMB, as was used for the creation of FEMA in 1978, or a new Executive Order. An EO was finally selected because it was believed to carry the most weight with the agencies and therefore was the most potentially effective. By that time (circa spring of 1991), Diana Todd had developed into a very capable and strong assistant to Richard Wright in this area and played an increasingly important and effective role in the events that followed.

ICSSC had already participated in the preparation of an EO, No. 12966 for new buildings, as I have described. The prospect of a new Executive Order that would be tied to minimum consensus building standards for all federal agencies, and both the standards and the new EO be the subject of a report to the Congress, however, was stimulating, to say the least. These considerations re-energized ICSSC and resulted in a high and sustained level of inter-agency active participation never attained since ICSSC's creation and not reached again to date.

### Annual Battle for Funds

**Morelli:** Here I need to open a parenthesis and discuss FEMA's position and attitude on the subjects of the earthquake program in general, and of another EO specifically. Over the years, I had been generally allowed to act

rather freely in this arena, subject to the usual annual battle for funds and the periodic reporting requirements. The support that I had received—mostly tacit, sometime overt—varied from nonexistent/indifferent to strong, the former under Republican Administrations (with two notable exceptions) and the latter under Democratic Administrations. (Full disclosure: I am a card-carrying Democrat). As a federal employee, however, I carried out my oath of office as diligently as I knew how in support of the earthquake program, regardless of the Administration in power. Witness the fact that I was occasionally in the front row, just behind the testifying FEMA official from several Administrations in Congressional hearings and even in speeches to large audiences—as a backup or provider of data and other information.

Admittedly, the George H. Bush Administration in power at the time, 1990, had in fact signed EO 12966, but under circumstances that I have already noted (the recent Loma Prieta earthquake.) My immediate supervisors viewed an activist like me with deep suspicion. (At an ICSSC meeting early in their tenure, one of them came and brought along three other team leaders to observe my behavior—no paranoia on my part in this incident, because one of the three several years later confirmed that fact.) Internally, FEMA's position was one of strong opposition to the program. Being leaders of the NEHRP, however, their opposition had to be carefully managed. Consequently, their public stance on the new document was one of detachment, probably counting on killing it, or at least crippling it later. In the meantime they had little choice but to allow me to proceed in participating in the effort that by that time was proceeding well under Richard Wright and Diana

Todd. The instructions that I received—when I received any—were ambiguous and that is all I needed to play my role in the ICSSC. It was not really a comfortable position for me, but I had nothing to lose—in retrospect, by that time I could have comfortably retired, although the thought never crossed my mind.

### Improvements to the Draft EO

**Morelli:** One improvement to the draft EO was the addition of a “grandfather clause” that exempted new buildings designed and built according to various codes and approved by each agency. Without it, agencies would have been obliged to evaluate all of their buildings. Even after such a clause was approved in principle, the drafting of the exact language caused more serious discussion and required many sessions. At the end, buildings constructed before the issuance of the new Executive Order that had been designed according to a standard that the agency itself at the time deemed adequate are exempt from the Order. The Standards also contains sets of conditions (“triggers”) that automatically require mitigation action by agencies, thus immediately creating a seismic safety program for existing buildings, though admittedly modest at first. The individual right of each agency triumphed at the end, but it was hard fought because of fear—which I shared—that too much leeway might eventually make the Order toothless.

The other significant provisions of the draft Executive Order established a mandate for the agencies to take a series of actions culminating in a report to the Congress on seismic safety of federally owned or leased buildings. Because a report on financially assisted or regulated

buildings—the remainder of the federal inventory—was already mandated by P.L.101-614, some of us activists saw this as a golden opportunity to place before the Congress a comprehensive picture of the seismic safety status of *all* federal buildings, regardless of the type or degree of federal ownership or involvement.

The greatest fear on the part of the agencies was that such a program would become an unfunded mandate, that is, an obligation to undertake a program without additional funding made available to them by the Congress, thus placing a significant strain on their resources. After long deliberations on various proposals on how to solve the impasse, an agreement was reached to add a clause that agencies would use their “normal budgeting process” to obtain the required additional funds. In other words, in preparing their respective annual budgets, they would be permitted to add funds to what they would normally request each year. This at first seemed to become a major obstacle to completion of the draft, but after considerable deliberation at several meetings, the concern was alleviated by inserting a clause that essentially authorized agencies to use “their normal budget processes” to fund the required activities. Thus, the mandate for the comprehensive report was added to the draft Order.

There were two additional obstacles to completing the draft: the length of time to satisfy these new requirements after issuance of the Order and the assistance that agencies could count on receiving, especially in gathering and processing the required building data, and from whom. After more lengthy negotiations, these obstacles were also cleared away. Agreement was reached on a timetable calling for

four years to inventory owned or leased buildings and an additional two years for FEMA to prepare and submit the report to the Congress. Also, with NIST providing the leadership, the ICSSC was to calculate the cost of rehabilitating those buildings that needed it and issue within one year the guidance that the agencies needed for all the actions required by the Order.

In its final draft form, the Order covers two significant areas. It adopts the Standards of Seismic Safety for Existing Federally Owned and Leased Buildings (discussed later), thus setting “life safety” as a minimum level of seismic safety for those two categories of federal buildings. This was a first in federal annals. Up to that time agencies had set and enforced their own minimum level, if any at all. In addition, it established an Executive Branch-wide effort to undertake a comprehensive examination of the entire federal existing building inventory, develop and cost a plan to make it more earthquake resistant, and report the results to the Congress. And that also was a first.

### Favorable Climate for EO

**Morelli:** As the work progressed, the attitude of the ICSSC members became more favorable toward completing the Order, while the FEMA opposition stiffened. I will always remember very vividly a session of the Full Committee that I believe was considering what essentially became the final draft of the Order. At that session, my then immediate supervisor insisted on representing FEMA himself. Before the final vote he asked for the floor and vehemently and at some length urged the members to reject the draft Order, adducing specious arguments, but nonetheless carrying on for what seemed like an eternity

(more probably about thirty or forty minutes). I sensed the way the winds were blowing against his position and urged him to ask the chair (Richard Wright) for a short recess. I used the time to point out that FEMA, as the leader of the NEHRP could not and should not vote “No,” but all I succeeded in doing was to have him abstain from the vote. All other ICSSC members present voted in favor of the draft Order.

That negative attitude was soon destined to disappear, however. Before the ICSSC completed its deliberations on the draft, there was a change of Administration. Bill Clinton had been elected, taking office in 1993. That brought to the head of FEMA a strong proponent of hazard mitigation, James Lee Witt. Witt turned out to be the best FEMA Director of my whole career. He imparted to FEMA a new high sense of purpose and of vitality that the agency had never reached before in its existence and has never achieved since, in my opinion. He believed that the federal government should play a strong leadership role in the hazard mitigation arena and he surrounded himself with top managers who shared his views and acted accordingly in day-to-day activities. My preceding supervisors either moved on or changed their attitude toward mitigation activities in general and the draft EO in particular. Consequently, my office life became less stressful and more productive.

Contemporaneously with the preparation of the draft Order, Diana Todd led an ICSSC working group in the development of an estimate of the cost of implementing the provisions of the draft Order. The carefully reasoned and documented estimate was about \$120 million, spread over five years and all

federal agencies. It served well its purpose, but only a tiny fraction of that sum was actually expended in preparing the report to the Congress. The reason for the difference is that most of the work was done in uncompensated overtime by a substantial number of federal employees—which is often the case.

The next step for the ICSSC Chair (Wright) was to officially transmit to FEMA the final version of the consensus-approved draft Executive Order, the Standards – also consensus-approved—, and the Todd cost estimate, with a request that they be forwarded to the OMB and to the president for signature. That step was completed early in 1994. Given the more favorable attitude toward mitigation actions that came to prevail in FEMA with the change of Administration and the arrival of Witt, the internal processing of this material proceeded very smoothly—unlike what happened in the case of EO 12966—although it was slowed because of the length of time it took for FEMA political appointees to be confirmed in their positions. So it was only in late spring of 1994 that I could give a briefing on this topic to the new Deputy Director for Mitigation, Richard Moore. Moore was a distinguished former State Legislator from Massachusetts who had a warm friendly personality and was strongly supportive of earthquake mitigation. He quickly became equally supportive of the draft and moved it to Witt's desk.

In general, I had little reason to interact with the director of FEMA. My first opportunity to deal directly with Witt, consequently, was in connection with a briefing on the draft. In a show of support, Moore accompanied me, but let me do all the talking. As I recall,

the briefing went well. Witt was easy to brief and not at all intimidating, at least to me. He was friendly, attentive, did not interrupt, but asked clarifying questions only at appropriate spots, and at the end approved the transmittal of the draft Executive Order to OMB for its approval and recommendation to President Clinton for signature. Shortly thereafter (late summer of 1994), the FEMA General Counsel—the only officially authorized channel—passed it and the cost estimate to his counterpart in OMB for the necessary processing. The transmittal letter appointed me as the FEMA working-level liaison, an action that gave me a great deal of leeway in dealing directly with OMB. And I took full advantage of the opportunity.

OMB showed special interest in the draft Order and processed it with unusual speed. The reason for this uncharacteristic attitude toward this particular matter is unknown to me. I have often mused about it, however, and always came to the same conclusion. Unbeknown to us at the working level, Witt used his reputed close personal friendship with President Clinton—dating back to when Clinton was Governor of Arkansas and Witt his Director of Emergency Management—to accelerate OMB's actions. In any case, within a few short weeks after submission, the draft Order was sent to the agencies for comments with an unusually short turn-around deadline of less than one week. Courtesy copies of the agencies' responses that I remember receiving indicated general concurrence with the draft Order, with some concern about costs being expressed by several of them.

## Funding Implementation of Executive Order 12941

**Morelli:** The Bureau of Prisons, however, had very strong objections, principally to the requirement that agencies were responsible for obtaining the needed funding through their regular budget process.

The Bureau of Prisons is part of the Department of Justice, and I learned that OMB takes particular notice of DOJ objections when it comes to EOs because such documents have the force of law. Further, DOJ has the final approval of EOs and I also learned later on that for that reason OMB tends to defer to DOJ positions more than to that of other agencies. Regardless of reasons, OMB in fact proposed to change the draft EO to accommodate DOJ's position and gave FEMA a choice: either insert "when economically practicable" in connection with the promulgation of standards for existing federal buildings, or permit agencies to opt out of the proposed EO altogether ("may request an exemption from the Director of Office of Management and Budget").

My position, endorsed by FEMA and forwarded to OMB, was that both changes were not acceptable because in different ways they both rendered the proposed EO meaningless. The counter-proposal was to leave the existing language in connection with Standards promulgation unaltered and to limit the exemption to a fixed time duration, say one year. FEMA received no further communication from OMB on this subject that I know of. And by then it was almost Thanksgiving and the deadline of December 1 not far away.

Taking advantage of a meeting on the Standards that was scheduled in Phoenix, my wife Dottie and I decided on a short vacation there the week preceding the meeting. One afternoon during that week we came back from a spin into the desert and the desk clerk at the hotel handed me a fax that had just arrived. A jubilant Todd was advising me that President Clinton had signed the order on December 1, 1994. I was overcome with emotions. This time, the work of so many civil servants had paid off, and quickly. The new EO, No. 12941, Seismic Safety of Existing Federally Owned or Leased Buildings, however, did contain an escape hatch (exemption) for any agency to request. To my knowledge, however, only DOJ, specifically the Bureau of Prisons, has ever asked for one, but it was not granted. Nonetheless, we took no chances. Early in the next year, Wright (as ICSSC Chair) prepared and forwarded directly to the Director of OMB a detailed and tightly reasoned set of conditions for the granting of an exemption, just in case it was ever needed.

## Engineering Provisions of Executive Order 12941

**Reitherman:** The EO covering existing buildings was going to require federal agencies to have programs in place by particular dates, but it didn't specify the actual engineering criteria to be used, is that right?

**Morelli:** Yes, the EO needed to incorporate by reference a separate engineering standard. While the EO was still in the early stages of preparation, Subcommittee 1 started to draft the required set of seismic standards for existing federal buildings, covering both evaluation

and rehabilitation measures. To aid in the effort, NIST selected two firms, principals of which had both played a continuous and strong role in this field: Chris Poland of Degenkolb Engineers, and William (Bill) Holmes of Rutherford and Chekene. As a matter of fact, Holmes was a pioneer in the field of seismic rehabilitation. I recall very vividly that, late in the preparation of materials for the Tempe meeting, a gap was discovered on what relevant seismic rehab projects had been completed. Holmes's name was the only one that the conference organizing group could identify. Out went frantic calls for Holmes, who was traveling, as I recall, but who—sure enough—in very short order provided quite relevant material to fill the gap. Since then, he has played a very strong role in the preparation of the most significant documents of the existing buildings series, often providing solutions to difficult engineering problems and authoring key sections of documents. Equally as significant is his continuing role as a practitioner of seismic rehabilitation at the state and local levels. His contribution to the program has been and continues to be huge.

To give the potential issues thoughtful consideration and to give the agencies ample opportunity to agree on their resolution, we decided to convene a two-day meeting of agency representatives out of the Washington area. Denver was selected as the venue and the two-day meeting took place in the fall of 1992. Led very capably by Bill Holmes, Chris Poland, and Diana Todd, the representatives debated each issue, at times at some length and with considerable controversy, weighted alternatives, and at the end reached consensus agreement on all issues. Promptly dubbed (by Holmes, I believe) as the “Denver Accords,” such

agreements were to serve as the basis of a new set of required minimum standards for existing owned and leased federal buildings—another historic first achieved by the program.

In early 1994 (about twelve months after the Denver meeting), Todd edited the Standards, incorporating revisions coming out of ICSSC deliberations, and made it ready for publication as Recommended Practice 4 (RP#4). At that point it was the most comprehensive volume in the RP series of ICSSC publications, which date back to the early years of the ICSSC. It was an example of federal agencies working together very efficiently.

In a little over a dozen pages of precise and concise prose—thanks to Diana Todd's expertise in clear and precise use of the English language and her dedication to the task—RP 4 succeeded in establishing the standards for evaluating and rehabilitating the federal building inventory and the major ground rules on how to do it. It set the fundamental concept of seismic performance objectives and “Substantial Life Safety” as the minimum acceptable level. It defined four additional levels that are also available for selection and implementation by federal agencies to satisfy their own special needs. The reach of the document is limited by a set of exemptions (e.g., leased buildings under carefully circumscribed conditions), a subject that generated lengthy discussions, as I recall. It assumes the use of FEMA 178 as an evaluation starting point and adopts the well-known principle of “benchmark years” for each of the building types described in that document and used consistently throughout the existing buildings series. Requirements and minimum standards for rehabilitation complete RP 4

itself, with a Commentary that follows providing amplifications and explanations.

For the sake of completeness, let me add that RP 4 was succeeded by RP 6 in 2002, in compliance with another stipulation of EO 12941. RP 6 reflects the advances in the state of the art of both evaluation and rehabilitation that are contained in FEMA 310 and 356, respectively. By the time RP 6 was undertaken by the ICSSC, I was so deeply involved in the report to the Congress on existing federal buildings that I hardly participated in the discussions and deliberations that produced it. As a gross generalization, it follows closely the approaches and fundamental tenets of its predecessor RP 4, but reflects the updated and more advanced versions contained in what eventually became FEMA 310 and FEMA 356.

With only a year to develop the guidance for the agencies to follow in implementing the new EO, NIST took prompt action. Todd became the point person in this effort and concluded it successfully by the deadline of December 1995. By the spring of that year, she and an assistant had ready for ICSSC consideration an extensive set of major issues and detailed options. The set was then intensely scrutinized and debated by the federal agencies in a landmark meeting similar to the one that produced the “Denver Accords” on what became the Standards, and that some of us named “the Gaithersburg Hilton Compact” from the location of the meeting. In the fall of 1995, Todd and the colleague used the results of the deliberations of that meeting to produce a key publication in support of the report to the Congress, namely RP 5, ICSSC Guidance on Implementing Executive Order 12941 on Seismic Safety

of Existing Federally Owned and Leased Buildings.

With the aid of members of Subcommittee 1 and of Poland and Holmes, Todd and her colleague took the guidance contained in RP 5 one step further. They produced a training document TR-17, *How-To Suggestions for Implementing Executive Order 12941 on Seismic Safety of Existing Federal Buildings, A Handbook*. It set uniform procedures to format the data that would be gathered for submittal to a common data base. RP 5 and TR-17 laid the essential foundations for generating the data necessary to treat federally owned or leased buildings in the report to the Congress.

The other two categories of buildings—federally assisted and regulated buildings, which the EO specifically designated to be the subjects of the report, remained unattended. Frankly, I was at first stumped as to how to proceed and where to obtain the necessary expertise. The first question was to define “financial assistance” in this context. The FEMA legal department, to which I turned for assistance, provided a very useful set of clarifications and amplifications for defining financially assisted buildings. As for “regulated buildings,” I set the ground rule that they would be all other types of buildings that did not fit the definitions of the other three—and that was the way they were treated in the report to the Congress.

### **Public Policy Analysis of the Existing Building Standard**

**Morelli:** At the same time, I was searching for an entity with an unimpeachable reputation and high standing in the Washington community, and a proven track record of concrete

accomplishments in the public policy arena to examine financially assisted and regulated buildings. I do not recall who or what event directed my attention to the relatively little known National Academy of Public Administration, or NAPA. Just like the much older and better known National Academy of Sciences, NAPA is chartered by the Congress (in 1985), and charged with the study of “any subject of government”—I still remember the words—needed by a federal entity that could pay for the necessary expenses. My search over. By the early summer of 1996, NAPA was under contract to FEMA to examine the implications of applying the Standards to federally assisted and regulated buildings, as a basis for a second major input to the report to the Congress.

Once under contract, NAPA followed its usual procedures and selected a dozen or so individuals from its 400-plus membership to form a panel to conduct the study. By the end of 1997 it produced a report and, as prescribed in the statement of work, presented it to the ICSSC members for comments. I will cover more specifics of the NAPA report contents in the context of the report to the Congress later on. Suffice it to say here is that in general, it was well thought out and articulated, and provided rather cautious but implementable recommendations on how to proceed to apply seismic standards to federally assisted and regulated buildings. Its caution was based mainly—and quite justifiably—on the need to minimize the impact on localities and respect the federalism that is the fabric of our country.

The insightful NAPA report, *Reducing Seismic Risks in Existing Buildings*, probed into how such instrumentalities as federal government

loans, grants, and guarantees of assorted types were being used and how they could become tools to improve the seismic safety of buildings that were the recipients of such forms of aid. Its most actionable recommendation was to apply seismic standards to thirty-three ongoing federal programs and to property disposal programs that the federal government has from time to time.

### Implementation of Executive Order 12941

**Morelli:** P.L. 101-614 directed federal agencies determine how to apply the standards to buildings that were financially assisted or regulated by the federal government and report the findings to the Congress. As soon as it became obvious that the draft of what became EO 12941 would contain a similar requirement for existing buildings owned or leased by the federal government, I had to start planning for a comprehensive report. By that time, my activities on existing buildings had the backing of the management team led by Moore, as I said earlier, so the process was not stressful, but laborious nonetheless. I had gone through it many times in the production of the “yellow books,” but in my mind this one was something very special. If successful, its impact would last many decades—alas, a huge “if,” as it turned out to be.

The frame of the report was set by the four types of buildings comprising the federal inventory: owned, leased, financially assisted, and structurally regulated. Because it might well become a controversial topic, and therefore closely scrutinized, it had to contain, preferably in one volume, a substantial amount of

detailed data. Its audience was likely to vary quite widely, from the top federal manager who would only tolerate a one-page summary, to the proverbial Washington “bean counter” that would go over it with the equally proverbial “fine-tooth comb.”

The results of the competition were not successful in selecting a supporting contractor. The preparation of the report was therefore set back about six months by the failure to be able to select a contractor in the first round of competition. I reached the conclusion that holding another open competition immediately would in all likelihood still not produce a winner. That meant that I needed in a great deal of hurry a procurement instrument that was quick and yet would not land me in jail, and an entity with the capability of preparing the material that would go into the report and produce the report itself. By serendipity (or a process of elimination, or both), I hit upon an instrument that I had not used for a very long time and that FEMA calls an Interagency Agreement—other agencies use different names. This is an agreement between or among two or more federal agencies to undertake a joint project with a stipulation of how the necessary resources, including funding, are to be provided. An Interagency Agreement was the perfect solution because the procurement regulations governing their processing are considerably more relaxed—and therefore much less time consuming—than for a competition for an award to an organization outside the federal family.

## Management Assistance from U.S. Army CERL

**Morelli:** Finding an entity capable and willing to do the necessary work, however, was more difficult. I believe it was Mike Mahoney who at the end pointed me in the direction of the army’s CERL, Construction Engineering Research Laboratory, in Urbana-Champaign, a component of which, headed by Dr. John Hayes, or Jack as he’s called, had conducted a small study for him. I had met Hayes, but do not recall when or in what circumstances, and had somehow learned of his earthquake engineering research. When I first contacted him about the possibility for CERL to act as the manager of the report preparation, his immediate reaction was most favorable, and so was that of his management. Hayes quickly became a key contributor to the effort and a very capable manager. The combination of his technical knowledge, his ability to handle and motivate not only CERL personnel, but members of other groups of the report team, and his even tempered demeanor (at least at the surface) quickly made him an invaluable addition to the effort. He became in essence the integrator of the major components that made the report the quality document that it became, and a major substantive contributor at the same time. The interagency agreement with CERL was completed early in 1999. Hayes moved quickly, and by that spring selected Chris Poland of Degenkolb Engineers to prepare the report. Poland in turn assembled a small, but strong team of contributors, all veterans of the FEMA earthquake program.

To this day I am grateful for Jack’s efforts and consider him a warm personal friend as well.

Hayes moved to NIST in 2006 to become the Director of the NEHRP, on the Secretariat of which I now am a *pro bono* member. The Inter-agency Agreement with CERL was completed early in 1999. Hayes moved quickly, and by that spring selected Poland of Degenkolb Engineers to prepare the report. Poland in turn assembled a small, but strong team of contributors, all veterans of the FEMA earthquake program. By then it was a scant year and a half before the deadline.

Todd's efforts with ICSSC members in the implementation of EO 12941 that I have already detailed (the Standards, RP 5, and TR-17, principally) produced the factual basis for the portion of the report that deals with federally owned buildings, the most detailed and policy-impacting portion. A vital part of that effort was a very extensive database that was created and assiduously curated by a member of Hayes' research group, Mr. Steven Sweeney. His major—but certainly not sole—contribution to the report preparation was to conceive, design, and manage a database of over 360,000 owned buildings, each one with dozens of significant physical characteristics that had to be captured, catalogued, and made capable of rapid retrieval and analysis. His efforts at reconciling the contents, checking their accuracy, negotiating needed changes, and inputting the data into a consistent format amenable to rapid analyses and impressive presentational aids were truly Herculean. Further, he was the repository of rehabilitation cost data and information on leased buildings, also prepared by the agencies, but in text form. His rapid responses to queries and dependability—as well as a sunny disposition—facilitated the decision-making process and were

an invaluable support to me and all other team members.

As soon as I could foresee an adequate and reliable funding stream for the report, I started to mull over a suitable title for it and at the end—with Poland's help—settled on “Towards Earthquake Resistant Federal Buildings.” (“Towards” somehow sounded somewhat erudite—to me—and conveyed a sense of progression). To emphasize its importance, we later added at the top “A Report to the Congress” and at the bottom the authorizing documents “*as required by P.L 101-614 and EO 12941.*” I also secured from the FEMA Publications Office a number that was available and seemed to me to be easily remembered: No.360. (Incidentally, to this day no FEMA publication is available with that number). The report itself is structured to satisfy the differing requirements of a wide spectrum of audiences, from the over-worked department or agency head to the detailed reviewer or researcher—including OMB Examiners.

The report or parts of it went through a long process of drafts and redrafts. I kept a copy of each draft stacked one on top of the other in the right-hand corner of my desk, until shortly before my retirement when I reluctantly disposed of them—the stack reached 18 inches in height. As we strove from the very beginning to make it, the final product was explicit, transparent, and, above all, defensible, and written in simple declarative sentences whenever possible. It came very close to the model that I had articulated to the ICSSC several years earlier and had been carrying around in my head since that time.

## Federally Owned and Leased Buildings

**Reitherman:** Summarize what the report said about federally owned buildings.

**Morelli:** As of 1998, the federal government owned about 360,000 buildings, some 80 percent of which (or about 290,000) already satisfied the seismic requirements set by RP 4. Of the remaining 70,000, a few less than 30,000 were located in low seismicity areas, hence were removed from further considerations. Thus slightly over 40,000 seismically vulnerable buildings were left in the federal inventory. In the process of gathering data for the Sweeney database, agencies evaluated a number of buildings and found about 10,000 of them were safe by RP 4 standards. So the number of owned buildings requiring action was about 30,000, or less than 10 percent of the total inventory.

For this category of buildings the team led by Chris Poland first designed discrete “packages” that varied in such significant attributes as seismicity of location, criticality of function, expected performance, and occupancy; packages were then grouped into various combinations and permutations based on the cost of each package. From these groupings, the team constructed some one hundred possible plans for making the buildings seismically safe. By using a transparent and rigorous analytical process and applying progressively more stringent criteria, the one hundred were successively whittled down first to twenty, then to twelve, then to seven, and finally to a single recommended plan.

The implementation of this plan was phased over a thirty-year span, with the first two years consisting of planning and other preparatory

work, and the last two or three a gradual phasing-out process. The cost of this plan was given as a range of between \$21 and \$26 billion, with about \$22 billion being the most likely (all costs in 1999-constant dollars). Bowing to the very strong feelings of ICSSC members expressed over a number of years and in many venues, strong language was included in the report to emphasize that these costs were over and above the usual funds appropriated to the agencies for normal operation and maintenance.

**Reitherman:** What about the proposed regulations for federally leased buildings?

**Morelli:** The number of buildings leased by federal agencies numbered about 50,000, with GSA holding 50 to 60 percent of them. Significant characteristics of this category of buildings were that over 70 percent were less than 10,000 square feet, and many were located in small or rural communities that did not have, nor enforce, seismic code provisions, and in these locations there was often little leasable space that was more seismically acceptable. The plan for this category of buildings called for ICSSC members to undertake a series of administrative steps. The major step was to phase out gradually over a ten-year period the exemption of federal leases from the provisions of RP 4, which allowed them to lease “best available” in the absence of seismically safe space. For long-term leases (over ten years in duration), the agencies were to conduct a seismic evaluation of the building within three years and move out within three more, if the building was found to be deficient and was not rehabilitated. Agencies were also given leeway to accept a rise in rent in exchange for seismic rehabilitation of the buildings by their respective owners. The

cost of the plan was a modest \$30–35 million for each of the first ten to twelve years and about \$10 million annually thereafter.

A phasing-in of deadlines also applied to financially assisted buildings. Compliance within three years with RP 4 standards as a condition for federal financial assistance was the core of the plan for this category of buildings. Mandatory compliance, however, applied only to buildings located in Very High and High seismicity zones—zones specifically defined for this report. Further, the loan had to represent 50 percent or more of the total project cost and applied only to projects that cost more than \$250,000. (I fought hard for a broader program, with RP 4 provisions applying to the next lower seismicity zone (Moderate) as well, and to 30 percent of the project cost, but lost to determined agency resistance.) The three-year implementation period—also a topic of much negotiating in several ICSSC meetings—was intended to give the handful of federal agencies responsible for construction loans and guarantees the time needed to gear up for the effort—I would have much preferred two years. Of the 1400 or so assistance programs in existence at that time, only about 50–60 were believed to be impacted by the plan. The NAPA report had an undeniably strong restraining influence on the reach of the final recommendations of the plan for this category of buildings. Incidentally, this is the only recommendation of the whole report that would affect FEMA, and then only in the case of a Presidentially declared major disaster.

## Private Buildings on Federal Land

**Reitherman:** That leaves the fourth category, private buildings on federal land. What is an example of that case?

**Morelli:** For the most part, these were in national parks (rather well-appointed hotels) and military installations (mostly schools), but no inventory could be compiled with the time and resources that were available. The major provisions for making these buildings seismically safe were to bring them into compliance with RP 4 standards within five years. If the agreement with the private owners extended beyond ten years and the buildings had selected occupancies (e.g., school-age children or mission-critical functions), a seismic evaluation had to be conducted within three years and future actions would be dictated by the results.

During the late fall of 1999, I remember reviewing many drafts of portions of the report, especially those dealing with owned buildings. I did not see a complete draft of the whole report, however, until sometime in January or February 2000. During that period, I lost the steady and sage support of two of my most valuable colleagues. Wright retired toward the end of 1999 to enjoy his family and some well-deserved rest from a long and fruitful career, along with many *pro bono* activities in his many fields of expertise. Even more telling for me was Todd's departure when she resigned. Her contributions, however, remain.

One more personnel change deserves to be noted, namely the departure of Moore to run to rejoin the Massachusetts legislature, whence he had come, and the arrival of his replacement, Mr. Michael Armstrong, who had been

the FEMA Denver Regional Director. My early relationship with Armstrong was rather frosty. For many weeks he showed no interest in my work. (As a matter of fact, I am not sure he knew who I was.) When he eventually discovered what I did, and especially the report to the Congress, however, he became an enthusiastic and very effective supporter. He was easy to communicate with and needed only three or four bullets to argue persuasively in favor of the report, which he often did. (He must have been a formidable prosecutor and a most successful lawyer before turning to a federal career.) Our professional relationship remained strong until his tenure was up at the end of Clinton's second term, and our paths still occasionally cross, much to my pleasure—he lives a few blocks from us in downtown D.C.

By the spring of 2000 not all loose ends had been tied up yet, but there had been enough progress in the preparation of the report that I could brief the FEMA OMB Examiner and his immediate supervisor—with a representative of the FEMA General Counsel's Office present, however. (As a matter of fact, ICSSC agencies were still reviewing the first complete draft at that time.) As is very often the case at this stage of contacts with OMB on significant programs, the reaction was polite, but noncommittal.

In general, agency comments were clustered around the portion of the report that covered owned buildings and dealt with funding and management issues, rather than overall structure, building priority groupings, and topics of that nature. They unanimously raised the concern that had dominated all discussions about the seismic safety of federal buildings

for the previous decade: funding for such a program had to be over and above the regular annual appropriations that agencies receive for construction and maintenance of their building stock—"new money" in federal vernacular, not an unfunded mandate. In addition, they all strongly favored the approach that FEMA be given a lump-sum annual appropriation and that in turn FEMA redistribute funds as needed to the individual agencies. This concern was allayed by "word-smithing," mostly by Poland, Hayes, and me: every mention of funding was immediately followed by an emphasized qualification that it had to be "new" money. The report does not even mention the possibility of appropriating all funds to FEMA for re-distribution to the agencies.

The other major issue centered around the need to smooth out the funding peaks and valleys that would have been created by stringent applications of the priority criteria governing the plan for this category of buildings. Poland solved this problem area by tweaking the building selection criteria somewhat, without violating the fundamental reasons for which they were originally established. He thus fashioned rather even annual funding requirements levels, except for the first two ramp-up years and the last three phase-out years.

During the summer of 2000 the report was put into final format, one volume with a number of appendices, as I have noted earlier, and given final editing that added photos, tables, and charts. These made it not only much more visually attractive, but also more communicative. During that time I briefed it through the FEMA management chain and then presented it to Witt. That briefing also went well, and the report was

approved for forwarding to the Director of OMB, together with a draft implementing EO that had been developed in parallel with the report.

## Administrative Action Required

**Reitherman:** This would be the third Executive Order dealing with federal buildings. What did it say?

**Morelli:** Its operative sections required two actions by all affected agencies: the preparation of an agency-specific plan to rehabilitate its vulnerable buildings, in accordance with the stipulations contained in the report; and submission—as a separate line item—a request for the new funds necessary to implement the plan each year until completion. With Todd's assistance, I had prepared a first draft sometime earlier and submitted it for consideration to the ICSSC, which processed it in the usual manner. There was much less controversy, however, so the process was much more expeditious than in the case of the other two EOs—very probably because the agencies' focus was on the report itself. In any case, the draft mentioned repeatedly and prominently specified “new appropriated funds” as “separate line items.” And as if these red flags were not enough to infuriate the OMB bull, there was a tasking to OMB to issue implementing instructions within six months! In re-reading the draft after all these years, I am amazed at how brazen we were at that time and marvel that it was approved by the Director of FEMA. Those were truly heady days for participants in this effort.

The three-page letter of transmittal of the report and of the draft EO to OMB (that I prepared) reviewed the history of the program (by then ten years old) and summarized the

provisions pertinent to each of the categories of buildings. A long paragraph conveyed in unequivocal terms the major concern of the agencies (funding for the program has to be “new”) and specifically endorsed their position. The letter also alerted the OMB Director of the strong antagonism of the agencies regarding all funds being appropriated to FEMA, and characterized such an arrangement as “unworkable.” It is dated September 13, 2000, which meant that OMB had almost three months for review and approval before the deadline.

## Twilight of the Report and of the Executive Order

**Morelli:** For several weeks following our submission I had only sporadic conversations with the FEMA OMB Examiner, mostly in response to clarifying questions. During these exchanges, however, I was unable to determine in which direction he was leaning—favorable or unfavorable. Then about Thanksgiving time, he asked me to meet with him and his immediate supervisor. From the very beginning of the meeting it became obvious that they had reached a staff-level decision, and it was not favorable: both the report and the EO needed fundamental revisions to meet OMB approval. I kept good notes on the meeting and subsequent exchanges with OMB and summarized their position in a proposed plan of action for FEMA management, a plan that I still have, from which I can quote.

“It infringes on the ability of the President to set priorities for funding in the annual President's budget by requiring that agencies budget for seismic remediation and

that requests for such funding be submitted to the Congress.”

“...the report language highlighting the need for new funds above the baselines, which suggests that agencies are unwilling to consider funding any remediation efforts without promise of new funds.”

“An EO is generally considered an inappropriate vehicle for providing budgeting guidance to the agencies.”

**Reitherman:** Did OMB suggest any way forward?

**Morelli:** The OMB response would not take us forward, in my opinion: “Strip the report of many of its recommendations and present it as an informational report on the costs of remediation.” In practical terms, we were being told to prepare another of those Washington reports that cost time and resources and are read by very few, if anybody, and causes no action to be taken. This was indeed a far cry from what we had struggled to achieve for almost ten years.

The solution OMB wanted was to “...Drop reference to budgeting for seismic rehabilitation, and substitute instead language requiring agencies to (1) annually review the cost of seismic rehabilitation and (2) report to OMB and FEMA on such costs and progress made.” The EO would provide guidance on the vehicle to be used for such reporting, but contain neither operative provisions nor references to new funding.

By that time we were close to the Christmas season when only very routine or emergency actions are taken in Washington. In 2000, the situation was aggravated by the quadrennial

change of Administration (Clinton’s, in this case) that places a hold on all important decisions of the federal government. In our case, it also meant the loss of the strong support that our activities had enjoyed.

**Reitherman:** At that point, did you have to give up the hope of getting the EO enacted?

**Morelli:** I did not give up, however. In an action plan that I fashioned in a hurry at the end of November after the OMB position became known, I outlined and recommended essentially two immediate steps for FEMA to take. In the greatest of haste, FEMA should ascertain that the staff-level response that we had been given was in fact the official OMB position—very likely—and, if so, have Witt (the FEMA Director) use his White House contacts to overrule OMB and obtain the release of both the report and the EO before the change of Administration.

My action plan garnered no support of which I am aware. The only other communication from OMB that I remember informed us that there were no plans to complete action on our proposed EO by the end of Clinton’s term. On the FEMA side, while I was on leave for the holidays, somebody—to this day I do not know who—prepared a short letter from Armstrong to the President of the Senate and the Speaker of the House to notify them that FEMA had submitted the required report on federal buildings to OMB in mid-September, and that the matter was under discussion with no OMB approval for submission as yet.

The best that I could do in the circumstances was to prepare a rather lengthy paragraph describing the report and the EO for inclusion

in the Transition Team briefing book, with the hope that it would catch the attention of the new Administration and keep the effort alive—although on life support.

**Reitherman:** What's the briefing book?

**Morelli:** In essence, it is a series of notebooks prepared by the career civil service staff—the professional, nonpolitical component of an agency that does not change with each Administration. They are designed to acquaint the transition team named by a new Administration—in preparation for taking over the direction of the agency—of all the major departmental policies and outstanding issues. The team generally appears on the scene about a month or so after the election and the component members often become the skeleton of the top political echelons of an agency after the new Administration takes over—hence transition team. They are a well-established transition institution, with funding for them included in the last budget prepared by an outgoing Administration.

## A Last (and Futile) Attempt

**Morelli:** During the first six to eight weeks after the inauguration of a new Administration, feverish activities take place at the highest levels of the federal government, like the selection of Cabinet members and their immediate staffs. Aspiring mid-level managers jockey for positions of prominence and try to impress their new or presumed new bosses. Working level personnel are generally quiescent, wondering who their new bosses will be, managing ongoing efforts, and generally keeping the engines of the federal government working and moving forward. New initiatives are

temporarily set aside. The Clinton-to-Bush transition from this point of view was no different. My action plan, as well as the report and the draft EO had become lost, so I could think of no action available to me in this matter, except to continue to keep the ICSSC and the report team informed of where matters stood. And be on the look-out for an opportunity to revive interest in the report.

That opportunity did not arise until early spring of 2001. By that time, the agency leaders, except for those requiring Senate confirmation, were all in place. Among them happened to be someone whom I had known professionally for a long time and had occasionally seen at conferences or other meetings and thus stayed in touch: Ms. Elizabeth DiGregorio. She was the new FEMA Chief of Staff. Officially, I had no reason to deal with her directly, but unofficially I decided to try this avenue to revive the report. When we would accidentally meet in the hallways, I at first mentioned and then stressed the fact that FEMA had not yet complied with a Presidential and a Congressional mandate to submit the report by December 2000. In fairly short time, the connection worked. She asked for a copy that I provided directly to her and thus the report became an item on the agency's agenda again.

The new FEMA Director had by then been named, but not yet confirmed, I believe. In any case, the day-to-day management of the agency was in the hands of the General Counsel—an unusual situation—and that position at the time was occupied by a Mr. Michael D. Brown. Yes, the very same Brown who became head of FEMA in 2003 and was in that position when Hurricane Katrina occurred. Eventually

DiGregorio arranged for me to brief him on the report, but the Brown that I came to know was to me an entirely different person from the negative public image that was formed a few years later during the Katrina disaster.

**Reitherman:** In what way? What was he like?

**Morelli:** He was urbane, friendly, attentive, and easy to brief. The subject matter of the report was obviously new to him, but it seemed immediately to capture his imagination and interest. He asked a large number of pertinent questions, so the briefing lasted twice as long as scheduled, and early on became a broad discussion about seismic hazards and consequent risks to the federal building investment. The briefing aids that Hayes and Sweeney had prepared were particularly effective and were especially useful in introducing Brown to the whole topic. He had no objections regarding the specific recommendations of the report and the implications of the EO. We also went over the OMB staff-level reactions to the previous submission and alternative courses of FEMA action. At the end he agreed to my very predictable recommendation that both documents be re-submitted to OMB without any change. DiGregorio and one of my new immediate supervisors were present, but let me do the talking.

Needless to say, my hopes soared high again, but, alas, the euphoria was short-lived.

**Reitherman:** What happened?

**Morelli:** The report and the EO were resubmitted to OMB by the end of May 2001. Within less than two weeks they were discussed at some length by Brown and DiGregorio in a meeting with the FEMA OMB

Examiner and his supervisor. Unfortunately, the OMB position was the same as under the previous Administration: strong opposition to the inclusion of time-phased expenditure figures in the report and the position that there was no need for an implementing EO.

From that point on, interest in the report and EO on the part of the FEMA management steadily eroded in spite of all my efforts to sustain it. Given this situation, I realized that the objective of getting the report and the EO before the Congress as we had originally conceived them was unattainable. Yet I was determined to salvage something from this intense decade-old effort on the part of so many dedicated people in and out of government. Getting a less-than-optimum product to the Congress became paramount in my mind. In early summer of 2001 I therefore developed a much less ambitious set of actions than originally conceived and began to sell it up the chain of command.

The central point of this new approach was to have OMB direct FEMA to prepare an implementation plan that specified the actions and necessary costs regarding all the categories of federal buildings that had been identified in the original version of the report to the Congress and in the same time frame and sequence. In its annual instructions to the agencies on budget preparation (the notorious OMB Circular A-11, "Preparation and Submission of Budget Estimates"), OMB would require each affected agency to include in its annual budget request a cost estimate to implement its share of the FEMA implementation plan. FEMA would have a continuing

coordinating, oversight, and reporting role in the implementation plan.

The new approach had the advantage of relying more on actions to be taken within the Executive Branch and on existing budgeting procedures to achieve the same ultimate results, with the report to the Congress playing a considerably lesser role. ICSSC members, however, were strongly opposed, but were never given the opportunity to express their opinion in a formal fashion. (By this time FEMA management had become much less inclined to rely on interagency cooperation.) The agencies' concern—quite legitimate—was unchanged since the very beginning of the effort, namely that OMB would saddle them with the task of rehabilitating their buildings, but provide no additional funding.

The interest of my management in this new approach to solving the impasse between the two agencies ebbed and flowed during the rest of 2001 and in early 2002. Although I have no specific recollection of the exact circumstances, sometime toward the end of 2001 I was asked to prepare a letter to the OMB Deputy Director proposing it. Despite Brown's concurrence, however, the letter failed to get the approval of the FEMA Director—I do not know why—and interest in this subject waned.

In late spring 2002, again under circumstances that I do not recall, the matter came to life again. This time my management accepted only the segment of my new approach dealing with a drastically different report to the Congress, one that was purely informational in nature, contained no recommendations for action, and provided only general indications of overall costs and time requirements. Fearing

that the interest would wane again or disappear entirely, I committed to having a report of this type ready in four to six weeks. The only way to keep this commitment was to enlist the help of Hayes and Sweeney, who all this time had stood by me and provided remotely the support that they could. Their first draft, however, was still too close in tone to the original version and I had to modify it extensively to produce the version that stands to this day.

In content, the basic concepts, definitions, and statistics on number and types of buildings in all categories of buildings are the same in the original and in the new version. Costs are presented in broad ranges, rather than single data points, however, and are described as possibly representative of the cost of an effort of this magnitude. Time requirements are treated in a similar, generalized manner. There are no recommendations of any sort and therefore gone are also the tight arguments to justify and defend them that were originally presented, mostly in the appendices.

The revised report was completed in early June 2002 and forwarded up my chain of command. From then to my retirement about seven months later, FEMA took no action. My reminders that the report was long overdue were met with the equivalent of a collective shrug of the shoulders. It became more and more clear that the will to submit it to OMB was lacking. So that was where this effort stood at my retirement.

**Reitherman:** What finally happened?

**Morelli:** My successor, Cathleen Carlisle, picked up where I left off, but faced even more formidable obstacles. Two months after my

retirement, FEMA and some twenty other agencies were bundled into the newly created Department of Homeland Security that predictably turned into a bureaucratic nightmare of the first magnitude. She had to navigate and battle both the FEMA and the new bureaucracy, but she finally prevailed a couple of years ago and the report was sent to OMB. And there it rests, still much needed and still valid in concepts and approaches, but by now not implementable because all the data it contains are ten to twelve years old. So much for a Congressional and Presidential mandate.

**Reitherman:** Was all the effort for nothing?

**Morelli:** No, fortunately not altogether. I understand from anecdotal reports that some ICSSC members, especially those in large departments like DOD, GSA, and DOI, have been slowly rehabilitating their building stock as part of their routine activities. In the case of DOD, the base-closing program has provided an additional impetus for seismic rehabilitation. So some seeds have borne fruits. That is my only consolation.

# Reflections on a Career in Emergency Management

*For the program to really flourish in the future, a fundamental structural change is necessary. That change is a transformation from a coordinated program to an integrated one.*

**Reitherman:** Let's get back to the earthquake reconnaissance trip to Italy you took, back in 1980, early in your career at FEMA. In a way, that also connects up your life story with your parents' home in Italy, in Grottaminarda.

**Morelli:** Yes, I would estimate the distance from the epicenter of the earthquake to their town to be about twenty miles, at most. It was to be my only trip to a disaster area of my entire career and an eye-opener as to the destructive force of an earthquake, although the magnitude was only 6.8.

I was the social scientist member of a team consisting of James Stratta, a private practice structural engineer and team leader; Ellis Krinitzsky, a geologist and member of the Vicksburg Waterways Experiment Station of the U.S. Army Corps of Engineers; and Luis Escalante, a lifelines engineer with the Los Angeles Department of Water and Power. I knew none of the other members and

met them for the first time at the Roma airport, where the team formed and very quickly coalesced. The team was a joint creation of the National Research Council and EERI, which then shared the responsibility for fielding reconnaissance teams sent to disaster areas.

After a day in Rome to gather basic information on the earthquake, we proceeded to Napoli, which became our home base. For a week we undertook day-long dawn-to-night auto trips to the affected area where there were no supplies or facilities of any kind to be found (yes, in most localities not even toilet facilities.) I never worked so hard in my life, not even in basic training during WWII.

The first day in Napoli we took a reconnaissance helicopter tour of the affected area and spotted the heaviest damage. This information and the data we had gathered in Roma provided us with the basis for selecting the localities that we would visit each day by motor vehicle. Once on site, we tended to stay together, but occasionally went our separate ways to pursue brief individual investigations. Back in Napoli each night at dinner we would compare notes and discuss the day's findings, and select the area to tour the next day.

**Reitherman:** What was your role on the team?

**Morelli:** Absent a protocol to guide my social science efforts and lacking previous relevant experience, I established my own areas of investigation and concentrated my efforts on them. They are reflected in the response and recovery chapter of the team reconnaissance

report.<sup>30</sup> There is first a thumbnail sketch of the physical setting of the disaster area and the existing societal conditions—a mountainous area with an almost exclusive agricultural economy based on small plots of land and small-scale animal husbandry. Then follows a summary of the governmental structure of disaster relief operations in Italy at that time, which, under the Minister of the Interior, called for the central government to be the first responder with soldiers and firefighters—then later a national organization, like the army. There is next a description of the magnitude of response operations to meet the needs of a large number of casualties (over 12,000, including at least 3,100 dead, out of a total population of about 3.5 million) and of homeless (over 170,000).

**Reitherman:** Why were the casualties so disproportionately high compared to the magnitude of the earthquake?

**Morelli:** For a combination of several adverse factors: the army units had to be redeployed from northern Italy where they were stationed in support of NATO operational plans; the earthquake struck at dinner time on a cold early winter evening, with most people at home, in houses of rigid unreinforced stone or brick masonry, with roofs of heavy wood beams and clay tiles; and the fact that almost all heavy debris-clearing and lifting

30 James Stratta, Luis Escalante, Ellis Krinitzsky, and Ugo Morelli, *Earthquake in Campania/Basilicata, Italy, November 23, 1980: A Reconnaissance Report*, published by EERI in cooperation with the National Research Council of the National Academy of Sciences, 1981, 100 pp.

equipment had to come from afar over a sparse network of narrow, curved mountain roads.

**Reitherman:** Did the victims get any benefits, as in our country?

**Morelli:** Yes, they did. The law has since changed, but at that time, benefits varied from disaster to disaster, with some being quite different from the ones that victims receive in our country. For victims of this particular event, there were grants: cash compensation for death (about 1980 US \$4,500, and up to three times as much in the case of a principal family wage earner); cash and construction materials for repairs of dwellings by owners; temporary shelter in tents, trailers, and even railroad cars in cases of destruction of residence; financial incentives to relocate permanently out of the area; remission of taxes due for the forty days after the event and delays in payments due during that period for private debts; and full compensation for workers prevented from working because of the earthquake for up to one year.

As a result of this earthquake, Italy passed a comprehensive disaster relief act patterned closely on our law, establishing a FEMA-like organization that reports directly to the Prime Minister, not the Minister of Interior, and fixing the types of benefits for all events. Members of this new organization used to visit FEMA from time to time and I had many occasions to brief them on our earthquake program, but I have no information on how this new law, or any successors have performed in the other events, including the recent 2009 L'Aquila earthquake.

**Reitherman:** Did the team bring back significant findings?

**Morelli:** Frankly, I do not believe we did. We have known for a long time that just about all unreinforced masonry buildings, especially when poor mortar is used, are at risk, even in a medium-size earthquake, so no surprise in the way it performed in this one. Similarly, lifelines suffered the interruptions observed in many other similar events, but were restored in good order. In the societal area, I heard complaints about the delay in arrival of help for the victims, but by the time we visited (about two and a half weeks after the event), matters seemed to be well under control: either the locality was completely evacuated or victims were being at least minimally sheltered or otherwise cared for. Even the order to completely evacuate survivors from heavily damaged area localities (80-90 percent of the building stock) seemed to be reasonable in the local conditions. I am speculating that the very high number of casualties was the decisive factor in the decision to field a reconnaissance team on the part of NAS and EERI, but I do not believe that the trip added to our earthquake knowledge.

**Reitherman:** Your parents came from this area. Did that affect you?

**Morelli:** Yes, very much so. It was at times quite emotional and sentimental for me. During the helicopter reconnaissance trip we flew over Grottaminarda (where my parents were born), in two, low-level, lazy loops (for my benefit). I immediately recognized the square steeple of the mother church, still standing—although apparently leaning a bit more than at the time I last saw it, forty years earlier. And

the mounds of stone and tufa blocks (and poor mortar) of what had been one-story houses built possibly in the early 1400s that I passed when I went to meet with my private tutor in the early thirties. I even spotted the area in the main square, behind the monument dedicated to the WWI dead, that we used for pickup soccer games in the summer. And at a very hastily-called family reunion of sorts (on my mother's side) the last night in Roma, I saw again several relatives, some for the last time and several for the first time.

Those were emotional moments that affected me privately. Looking back, I can now see that there were moments of equal intensity that subconsciously prepared me for the assignment as FEMA manager of the earthquake program that was to come less than two years later. I am referring to experiencing first-hand the impact of utter devastation of village after village, and the eerie silence that we would experience when we stopped for observations in evacuated localities; or seeing the sullen expression of people standing in line for a meal from portable army kitchens; or the sense of hopelessness while standing among the rubble of what was once a church where many generations had worshipped or a hospital buildings with personal records scattered on the floor. A million pictures cannot recreate the suffering of the victims, but during a visit to a disaster area one experiences it personally. And that personal experience is what reinforced in me the resolve to try to alleviate it. It was a good preparation for me, indeed.

**Reitherman:** Sounds like the trip was personally rewarding for you. Doing reconnaissance work after the 1985 Mexico City

earthquake, where about 10,000 died, and after the 1995 Kobe earthquake, with a death toll of over 5,000, had a similar motivational effect on me.

## Reflections on the Federal Earthquake Program Today

**Reitherman:** Let's move on to the earthquake program today. How is it going, from your point of view?

**Morelli:** First a full disclosure: I am the *pro bono* member of the Secretariat of the NIST program leadership. This function used to belong to FEMA and was transferred to NIST by the Congress shortly after I retired. The reason for this shift was because FEMA had neglected it for many years, including during the time that it was my responsibility, in addition to several others. What follow, however, are my *personal* views.

Each agency now independently plans, budgets, and manages its Congressionally assigned segment of the program. NIST leadership furnishes the necessary *coordination* in several forms. There are monthly meetings of the heads of the earthquake program in each of the four agencies during which comments on ongoing activities in each agency are exchanged and a few joint efforts are discussed. There are also almost daily contacts on other topics of common interest by other means or in different venues. Heads of the four agencies meet once or twice a year, are appraised of progress, and provide very broad general guidance. An advisory committee meets two or three times annually and prepares a report on the status of the program for the NIST Director. There is also an annual report (one year in

elaborate and the next year in summary format) that NIST produces from inputs from the other three agencies. A five-year plan was prepared very soon after the transfer of leadership responsibility and is still in effect—although only very generally followed.

NIST, in the person of Hayes and an able assistant, are performing the coordination functions very well, better than ever since the inception of the program. Also, the NIST research segment has finally come to life and is very promising. The best (and most publically known) activities belong to USGS with outreach programs of national and international reputation, but I know nothing of their earth sciences endeavors. NSF research is driven by the interests of academic investigators, as it has since the end of the RANN program. Laboratory facilities nationwide have been updated and digitally connected under the NEES Program. And FEMA is struggling not to be suffocated in the DHS bureaucracy and doing its best with a reduced budget.

Against this background, there are two glaring shortcomings. The first is the lack of coordination on *existing* buildings in the projects that NIST and FEMA are now pursuing. These projects are key ingredients of that part of the program that transforms research results into practical applications for practitioners' use and causes them to be adopted into building codes. The second is the practical demise of the ICSSC, the body that had played an effective and vital role in the 1990s and early 2000s in shaping the seismic policies on existing federal buildings. These gaps exist despite the fact that this is one of the five "priority" areas identified in the NEHRP 5-year plan. (I bet I have made

a flock of new enemies with those terse summary statements!)

Aside from these two gaps, the program is progressing as much as possible in the current legal framework and current budgetary constraints—probably about to worsen. Going forward, I can see only marginal improvements. For the program to really flourish in the future, a fundamental structural change is necessary. That change is a transformation from a *coordinated* program to an *integrated* one.

**Reitherman:** What do you specifically mean when you use those two words?

**Morelli:** An integrated program would have one agency given the responsibility to plan programs, budget for them, task one of the other three for implementation in accordance with the expertise that it has, and ensure results. That would make an integrated program. This concept requires a drastic change in the way the Congress views the program and a new basic law, coupled with fundamental changes in the management attitudes and operations in the four agencies. In turn, this will never come about without a strong sponsor of the program in the Congress—missing since the passing of Rep. George E. Brown—and, of course, at least a benign attitude on the part of the Administration in power. My estimate is that there is only a very low probability of any such change happening even in your lifetime, Bob.

**Reitherman:** FEMA Directors are often in the national spotlight, especially during disasters. Any interesting insights on the ones you have known?

## FEDERAL EMERGENCY MANAGEMENT AGENCY DIRECTORS

NAME	TERM OF OFFICE
*Gordon Vickery	April 1979–July 1979
*Thomas Casey	July 1979
John Macy	August 1979–January 1981
*Bernard Gallagher	January 1981–April 1981
*John W. McConnell	April 1981–May 1981
Louis O. Giuffrida	May 1981–September 1985
*Robert H. Morris	September 1985–November 1985
Julius W. Becton, Jr.	November 1985–June 1989
*Robert H. Morris	June 1989–May 1990
*Jerry D. Jennings	May 1990–August 1990
Wallace E. Stickney	August 1990–January 1993
*William C. Tidball	January 1993–April 1993
James L. Witt	April 1993–January 2001
*John Magaw	January 2001–February 2001
Joe M. Allbaugh	February 2001–March 2003
Michael D. Brown	March 2003–September 2005
R. David Paulison	September 2005–January 2008
*Nancy Ward	January 2009–May 2009
Craig Fugate	May 2009–Present

\*Acting director

**Morelli:** I had direct dealings with only three or four of them and I have already mentioned them at some length, such as Macy, Witt, and Brown. In general, none paid close, sustained attention to the earthquake program. FEMA has always been an essentially disaster-management agency, with response and recovery after a disaster being the focus of the director's attention. The activities designed to lessen the impacts of the phenomenon—variously known over time as “preparedness,” “mitigation,” more recently “resilience,” maybe soon “sustainability” and who knows what else—have been neglected, with the sole exceptions being Witt's Project Impact and Moore's mitigation efforts (and the latter was only a deputy director). I made some contribution to these efforts, but was not very close to either. My general impression is that both created a great deal of initial mitigation buzz, but both produced only a few lasting results in a limited number of communities. On existing buildings, however, Witt, Moore, and Brown were very supportive of my efforts, as I have already covered.

I had direct dealings with only one other director, the one that succeeded Macy, Louis Giuffrida, but not on earthquake matters. Incidentally, we did not take him seriously, even made fun of him, but his interest was decades ahead of his time: terrorists! So much so that he was reputed to carry a hidden gun until informed that it was forbidden in federal buildings. In any case, he heard that I spoke Italian and asked me to be his “interpreter” when he occasionally called the headquarters of the Carabinieri in Rome to discuss international police matters. He insisted on speaking in Italian, however, not English. The only problem

was that his version of Italian turned out to be a Sicilian dialect that even I had difficulty in understanding. So my “interpreting” consisted of my understanding what he was saying and putting it into correct Italian. Unlike a handful of FEMA employees, I was neither his poker-playing companion, nor his lunch guest for one of the gourmet lunches that he occasionally prepared himself in the especially well-equipped kitchen that was built next to his office.

**Reitherman:** Those transatlantic conversations must have been interesting. On to another topic. You joined the natural hazards field almost forty years ago. What are the areas in which we have made the greatest advances, in your opinion?

**Morelli:** Since FEMA was created in 1979, I have worked almost exclusively on the earthquakes topic, so I will restrict my answer to the two that I believe to be the most consequential achievements in that area.

The first is the realization by both experts and lay people that the earthquake hazards and risks are nationwide, not just a “west of the Rockies” problem, as it used to be considered to be in the 1970s. This conceptual broadening has had innumerable effects on the thinking and acting of all major participants of what we call the earthquake community. There are any number of researchers in seismic topics and seismic engineering courses in eastern faculties, where there used to be only a handful in the 1970s. There are at least two major centers, five NEES seismic labs, and seven CUREE members east of the Mississippi. Even the building code of New York City contains strong seismic provisions. This was

unimaginable when I first arrived on the hazards scene. The late Prof. Otto Nuttli of the University of Saint Louis was then the only person that I remember writing about and lecturing extensively on the seismic hazards in the central United States, and emphasizing the urgent need for mitigation actions, often to very skeptical audiences.

Next is the rapidity with which new research findings and design concepts find their way into building codes. As I believe I have already mentioned, in the late 1970s and early 1980s this process used to take some fifteen years. With the publication of the first Provisions for new buildings in 1985, that lag was already shortened by at least half. By the time I retired, it was a matter of months. In the balloting of what was to become ASCE 41, a design procedure—I unfortunately cannot recall which specific one—did not pass. An investigator who was participating in the effort found a solution based on recent research results that answered the specific objection that had been raised. In a matter of a week or so, he prepared the necessary technical documentation that was submitted in the next balloting and the new procedure was incorporated in the text. It was a matter of a few months from research results to code provision. Admittedly this is not always the case, but I believe there is general agreement that the process is fast—or at least was when I retired.

Undoubtedly there have been several significant advances in addition to the two that I have described that perhaps had even greater impacts, but I was not intimately involved with them and therefore they do not loom large in my judgment. Good examples are FEMA's

HAZUS program and the seismic maps produced by USGS, especially the knowledge that underpins them.

**Reitherman:** What do you consider your top success and top failure of your own long career in the earthquake area?

**Morelli:** I will let others decide what success, if any, I achieved. I prefer to look back at what causes me the greatest satisfaction.

First, without any doubt, is the satisfaction of having marshaled the talent and other resources necessary to produce the rather long list of “yellow books.” Another satisfaction is seeing the demand for these volumes to be so huge and to originate from practically the whole world. I did not keep a count, but FEMA must easily have printed a quarter of a million copies of the volumes in the series, and still does (although many are now distributed in electronic form, probably widening distribution significantly, and alas, some are no longer “yellow”).

Then there is the coming into existence and general acceptance of mechanisms by which periodically updated reference materials for both new and existing buildings, developed with federal funding, become the foundations for nationally applicable codes and standards and, through them, diffuse into private practice. It could not and would not have happened without a large assist from BSSC and ASCE, but nonetheless represents quite a drastic change in attitudes from the one prevailing when I first entered the natural hazards arena in the early 70s, when “federal government” and “codes and standards” were separated by a large minefield of mutual distrust.

Last, but not least, is the development and publication of the first nationally applicable performance-based set of provisions for rehabilitating existing buildings in this country that I have covered in detail earlier, with principal credits here going to Shapiro and Poland and their teams.

My greatest failure is easy—but painful—to identify: not having succeeded in getting the report on seismic safety of federal buildings to the Congress of the United States for whom it was intended. What pains me most in this regard is the waste of the talent and dedication of so many government employees and of the hard-earned American taxpayer's money. Equally painful is the realization that to this

day I do not see what additional effort on my part could have or would have prevented this failure. My remaining troubling thought is that I should have disobeyed strict orders and kept a staffer or a member of the Congress informed of the report contents and enlisted his or her help in getting the report out of OMB. As a minimum, the knowledge contained in the report would have been unofficially available to the Congress. In any case: too late now.

**Reitherman:** If the comprehensive program for federal buildings hadn't been such a great goal, it wouldn't have been such a disappointment to see it fail to be enacted, so perhaps the failure is bittersweet.



# At Home

*After my wife Dottie, music is my love and joy in life.*

**Reitherman:** Readers of these EERI oral histories want to know something about the personal aspects of the subjects, not just their careers. You are known for your interest in music. Do you want to say something about that?

**Morelli:** Yes, indeed, and with much pleasure. After my wife Dottie, music is my love and joy in life—unfortunately not music-making (at which I amply demonstrated my ineptitude on the violin at an early age), but in the enjoyment of music-making by others. As I have already recounted, I started out being interested almost exclusively in opera, and specifically, Italian and French opera, like my parents. There was only slight broadening of my musical horizons until in my early twenties my former wife introduced me to ballet in spectacular fashion at the Paris Opera when I was living in Paris. This interest continued through my first marriage and then divorce, and grew stronger when I met Dottie, as she too fell in love with ballet. Together we have spent some of our

best hours together attending performances at the Kennedy Center, Friday nights, for almost thirty years in the same seats (first tier, center section, first row), that allow us to appreciate the ensemble view of the action on the stage as well as solos. We enjoy both traditional and modern ballets, and occasionally an avant-garde one as well.

My interest and enjoyment of symphonic, and then chamber music—in that order—developed naturally from my love of music in general, that is, under no specific stimulus or set of circumstances. We have subscriptions to two symphony series, which means that we are at the Kennedy Center many additional weekends from September to June, in the same or near-by box seats (around the Presidential Box) that we also have had for most of thirty years.

I like all periods, and most composers and styles, from Renaissance and Gregorian to very contemporary. Frankly, however, I find a great deal of Baroque music repetitious and therefore boring (I can just hear the howls of indignation), and I am not excluding compositions by Bach (and his large brood of descendants). To me they often sound like expertly orchestrated finger exercises. This reaction may well stem from my lack of knowledge of the fundamentals and intricacies of the art of composition and orchestration, but is nonetheless real. I also much dislike what I call “minimalism,” that is compositions consisting mostly of a few notes played from disparate sections of the orchestra, punctuated by long pauses. I equally dislike those calling for all sections playing *fortissimo* a cacophony of strident sounds.

In small doses, I also enjoy jazz and country western. Dottie introduced me to country western, and is my tutor and source of all information on this matter. You mention almost any name in that field and she will readily supply not only the related biographical information, but also the discography, if you can still use that term in this era of CDs and DVDs. We attend some performances of these genres, but not many. Our cultural life is rounded out by occasional visits to a museum, mostly in connections with special exhibits.

**Reitherman:** You seem to have a very active cultural life, and Washington, D.C. is one of the great cities in which to enjoy that. In what other city can you walk through one Smithsonian museum on the mall on the way to an appointment, exit the other side, enjoying the free admission and a few minutes of aesthetic refreshment. In addition, of course you can go back to favorite museums to spend hours.

How about your travels? Any favorite places?

**Morelli:** None that you might characterize as “exotic.” Dottie is still employed full time in a demanding position—and enjoys it very much. So our vacations cannot be very long. We take about two-week trips during the summer. We have visited just about all the major national parks in the U.S. and some in Canada. We like and have frequently visited Canada, especially the province of Québec and the environs of Lake Louise and Banff—so much so that it aroused the suspicions of the investigator in charge of clearing Dottie for the very sensitive position she holds, who kept asking for reasons for such frequent trips across the border and could not understand the simple answer: we just enjoy going to Canada.

**Reitherman:** Do you have other interests or activities in retirement?

**Morelli:** Yes, indeed, I have two, both *pro bono* activities, a choice that I made very early on in my retirement. I have maintained my interest in the earthquake program, primarily in existing buildings—naturally. I first worked with Carlisle, my FEMA successor. She quickly became comfortable in the job and proceeded to establish her own personal style and priorities in managing it, however. Consequently, she really needed little support from me. And I could offer no advice on new buildings to Mahoney who has excellent sources of his own. So my association with FEMA has almost disappeared over time. After the leadership of the NEHRP was transferred from FEMA to NIST and Jack Hayes was selected to lead the effort, however, I was asked to join the Secretariat. It consists mainly of attending periodic meetings of the working heads of the four principal earthquake program agencies and occasionally providing comments on program planning and other related documents. It is not really much of a contribution, but allows me to remain close to the program I love.

The other activity is in a field to which I long wanted to make some contribution, but had not really expended the necessary effort to do so: give some time to help the homeless, of whom D.C. has its share. I found an organization, Miriam's Kitchen, that not only feeds, but also offers counseling, training, and eventually housing to the homeless. I help serve lunch to the "guests," as they are referred to, about twice a month, sometimes more often. (Miriam's Kitchen has a wait list for persons who

want to volunteer—I waited over two months before being called.) The type of work is hard on somebody of my age—demanding to be on one's feet for several continuous hours—but the satisfaction I derive from it is well worth this little extra effort.

**Reitherman:** I hear you are also interested in antiques, aren't you? Having interviewed you several times here in your home in D.C., I always move around carefully because the furniture looks precious and the art objects on them even more so.

**Morelli:** Yes, I am, and so is Dottie. We enjoy a great deal going to antiques shows and visiting antiques stores. That is how we spend a good portion of the time when we are on vacation, as a matter of fact.

**Reitherman:** Do you collect anything specifically?

**Morelli:** Yes, we do. We collect American Belleek porcelain, the first fine china that our country has produced, rivaling the best of European porcelains (Limoges, Dresden, and Minton, to name only a few), yet it is not well known by collectors and even by dealers—most people have heard of *Irish* Belleek, but not *American* Belleek. As a matter of fact, Dottie discovered it for us by accident. At a local show, her attention was attracted to a piece of china in a silver holder, with a mark (technically called a "back-stamp") with which she was not familiar. It turned out to be an American Belleek piece, a mayonnaise holder, to be more precise. The owner of the booth provided us with the first information about American Belleek we ever had and the name of a reference book. We quickly became very interested

in this porcelain because of the delicate, diaphanous beauty and, after learning more about it from reference books and dealers, we became hooked on it. In the twenty-five years or so since Dottie's chance encounter with it, we have slowly acquired a number of pieces that we enjoy and treasure.

**Reitherman:** I have never heard of it. What is American Belleek?

**Morelli:** I could go on for hours, but, very briefly, it was produced between about 1875 and 1930 by some three or four firms located around Trenton, New Jersey and an equal number in Ohio and near Pittsburg, where clay deposits similar to those used in Ireland to produce Irish Belleek were found. American artistry and entrepreneurship and some imported Irish artists and artisans provided the other essential ingredients. The industry flourished until roughly World War I, producing both decorative items, like vases and urns, and functional ones, like dinner and coffee sets. Then it started a slow but steady decline until 1930, when the sole surviving firm, Lenox, ceased producing porcelain considered to be American Belleek, probably another victim of the Great Depression.

To complete the picture, other activities that take up my time are tending to our investments (Dottie and I do our own) and walking a mile every day (to keep my lazy heart in some sort of shape.) So, my "leisure" time is really nonexistent. My "to do" list is always long, and even longer is the list of books that I want to read. And that is the way I like it to be to the very end of my life—busy.

**Reitherman:** Sounds like a good philosophy. Any other thoughts?

**Morelli:** Only three more, Bob.

I am thankful for all those who participated in the projects that created the many FEMA "yellow books" over the years. And I appreciate the EERI oral history series and your work on mine over the past five years when we could get together. There's history documented in the volumes in the EERI series that one cannot find anywhere else.

And of course, I am thankful to Dottie, my love.

# Photographs



*The house where Ugo's father was born, in Grottaminarda, Italy.*



*Ugo with his mother in Medford, Massachusetts (winter 1922-23).*



*Ugo's father, Michele Morelli, in the Medford, Massachusetts house where Ugo was born.*



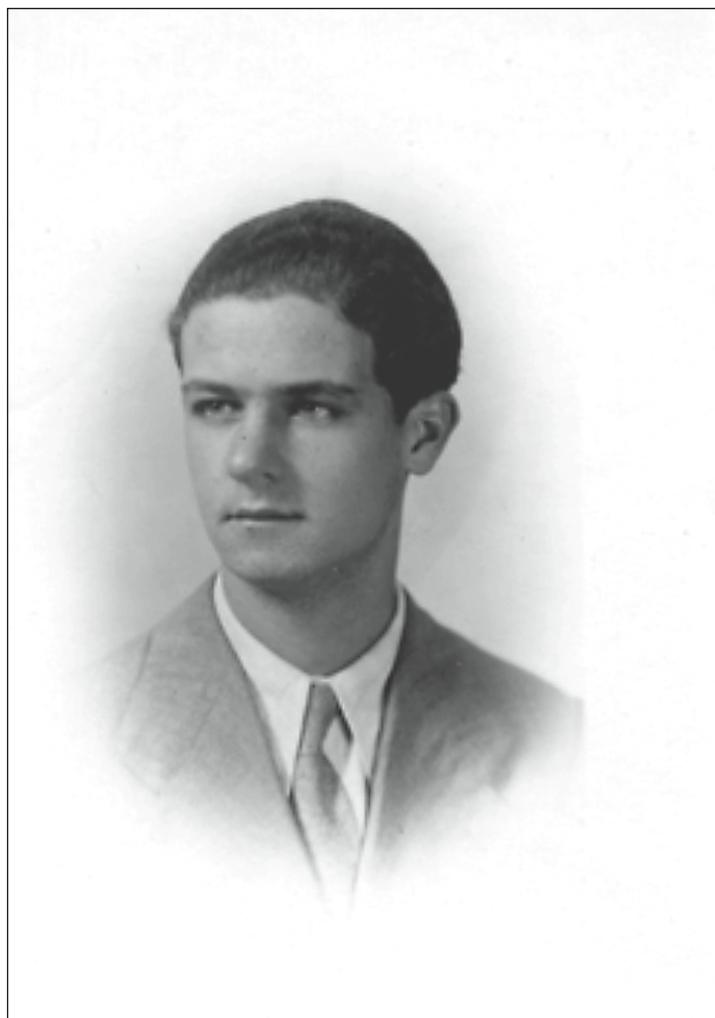
*Young Ugo at an air show in Maine.*



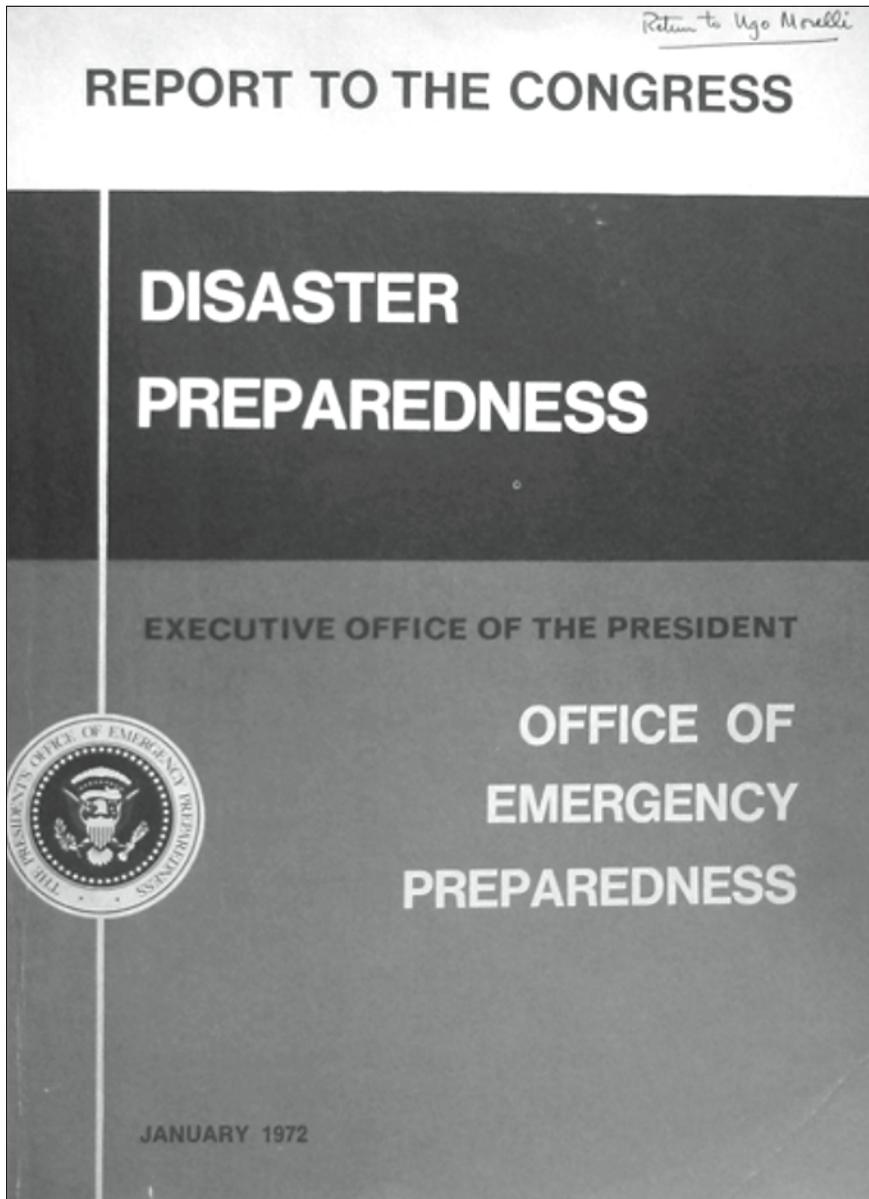
*On the beach in Maine (circa 1928).*



*Ugo at age thirteen in Italy.*



*Ugo at age 18, just before returning to the U.S.*



*The 1972 Disaster Preparedness report of the Office of Emergency Preparedness. Ugo authored the "Earthquakes" and "Land Use and Construction" chapters. This is the project that got Morelli "into the earthquake business."*



*At the first ATC Awards Dinner in San Francisco, July 1998. From left to right: Diana Todd, Ugo Morelli, Ugo's wife Dottie Madison, Lois Shapiro, and Dan Shapiro.*



*Ugo accepting the first ATC Award of Excellence for "Extraordinary Contribution as Project Officer" from Charles Thornton at the same July 1998 ceremony.*

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