

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

Before the Nuclear Regulatory Commission

In the Matter of)
)
PRIVATE FUEL STORAGE L.L.C.)
)
(Private Fuel Storage Facility))

Docket No. 72-22

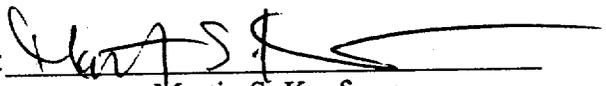
ASLBP No. 97-732-02-IFSI

NOTICE OF APPEAL

PLEASE TAKE NOTICE that Scientists for Secure Waste Storage ("SSWS") hereby appeals, pursuant to 10 CFR §2.714a, from so much of the Memorandum and Order (Rulings on Standing, Contentions, Rule Waiver Petition/Administrative Matters)(LBP-98-7) dated and docketed April 22, 1998 that denied the petition of SSWS to intervene.

Dated: New York, New York
May 1, 1998

Atlantic Legal Foundation
Attorneys for Scientists for
Secure Waste Storage

By: 
Martin S. Kaufman

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New York, NY 10017
(212) 573-1960

Licensing Board, by order dated April 22, 1998, denied SSWS's petition in all regards².

SSWS respectfully submits that the Licensing Board's majority³ erred and abused its discretion in denying SSWS's petition, and that the Licensing Board misapplied the criteria for discretionary intervention.

Scientists for Secure Waste Storage

SSWS is an ad hoc group of 17 scientists, engineers and educators, whose interest is in promoting and presenting scientifically and technically accurate information to the Commission and its Licensing Boards on issues within its areas of expertise⁴, nine of whom are distinguished educators in the sciences, and who are affiliated with renowned institutions of higher learning. Several of them are Nobel laureates in physics or chemistry. Several of the members of SSWS have served in important positions in nuclear power industry. Several of the SSWS members have held senior positions in this agency or its predecessor. Members of SSWS have served as senior advisors to the President of the United States or to foreign governments on issues of nuclear energy and nuclear safety. Collectively, and have a profound knowledge of theoretical nuclear physics, applied nuclear physics, nuclear engineering, nuclear safety, risk assessment, contingency planning, environmental science and other issues that are integral parts of the licensing process for nuclear facilities, including spent fuel storage facilities.

² The Order dealt with numerous matters, and is quite lengthy. SSWS, of course, addresses only those portions of the Order that speak to SSWS's petition.

³ The decision of the Licensing Board was on a 2-1 vote, with Administrative Judge Peter S. Lam dissenting.

⁴ Detailed information concerning the backgrounds of the members of SSWS is contained in Appendix A.

Issues SSWS Would Address if Permitted to Intervene

The issues SSWS seeks to address are set forth in SSWS' Supplemental Petition, as is information as to the proposed witnesses and scholarly works on which they will in part base their testimony.

ARGUMENT

THE LICENSING BOARD ABUSED ITS DISCRETION IN DENYING THE PETITION OF SSWS TO INTERVENE AS A MATTER OF DISCRETION

The standard of review of a licensing board denial of a petition for discretionary intervention is "abuse of discretion." See Florida Power & Light (Turkey Point Nuclear Generating Plant, Units 3 and 4), ALAB-952, 33 NRC 521, 532, aff'd, CLI-91-13, 34 NRC 185 (1991). We respectfully submit that the Licensing Board abused its discretion by failing correctly to balance the weighty benefits that would accrue to the proceeding and the record if SSWS were permitted to intervene against the minimal risks of delay. We submit that many of the Licensing Board's concerns were based on pure speculation, some of it about the internal operations of SSWS, which are simply incorrect. We also submit that the Licensing Board's fear that SSWS's "academic interest" would necessarily broaden the issues is misplaced, and even if they were correct, can be ameliorated by procedures the Board can itself impose.

The Commission developed its test for admitting a petition to intervene as a matter of discretion in Pebble Springs. CLI-76-27, 4 NRC at 616; see also Applicant's Answer to Amended Petition of Scientists for Secure Waste Storage, February 13, 1998 at 2. The Commission drew four of the six factors in the discretion test directly from the late-filed test. Compare Pebble Springs, CLI-76-27, 4 NRC at 616 with 10 CFR §2.714(a)(1). The development of the record, the availability of other means to protect the petitioner's interest, the extent to which the petitioner's interest will be represented by existing parties, and the broadening of issues or delay of the proceeding were all

drawn from the late-filed test. See supra. In the discretion test, the most important factor is the development of the record, e.g., General Public Utilities Nuclear Corporation (Oyster Creek Nuclear Generating Station), LBP-96-23, 44 NRC 143, 160 (1996), and Order at 44. In the late-filed test, the most important factor is the existence of good cause, which is absent from the discretion test. Yankee Atomic, LBP-96-15, 44 NRC at 24-25.

The practice in applying the discretion test is consistent with the policy behind discretionary admission: it is allowed not as a matter of right for the petitioner but rather for the benefit of the Board and the public good.⁵ See Pebble Springs, CLI-76-27, 4 NRC at 615-17; Black Fox, ALAB-397, 5 NRC at 1145. Thus the essential question in discretionary admission is not whether a petitioner has the right to participate but whether it would be beneficial to the Board and the public for the petitioner to do so.

Concerning the factors of the discretion test, the four adopted from the late-filed test are considered the same way, although they are accorded different weights. See Perry, LBP-91-38, 34 NRC at 245-52. The remaining two--the extent of the petitioner's interest in the proceeding and the possible effect of any order from the proceeding on the petitioner's interest--were drawn from 10 C.F.R. § 2.714(d), the purpose of which is ordinarily to allow a board to determine whether a petitioner has an interest in a proceeding sufficient to warrant judicial standing. Florida Power & Light Company (Turkey Point Nuclear Generating Plant, Units 3 and 4), ALAB-952, 33 NRC 521, 529 (1991) (citing 10 C.F.R. § 2.714(a); Pebble Springs, CLI-76-27, 4 NRC at 614). In the context of discretionary intervention, however, the purpose of those factors is to demonstrate the importance

⁵ Late admission as of right (under the late-filed test) is for the benefit of the petitioner; petitioners coming to a hearing without good cause for lateness are sometimes said to have been "sleeping on their rights." E.g., Black Fox, 5 NRC at 1147 n.10; Shoreham, ALAB-743, 18 NRC at 396 n.37. In addition, petitioners intervening as a matter of right may participate with respect to all issues raised in the hearing, while petitioners admitted at a board's discretion may only participate to the extent allowed by the board. Pebble Springs, CLI-76-27, 4 NRC at 617.

and immediacy of the issues proposed for consideration and justify the time necessary to consider them. See Pebble Springs, CLI-76-27, 5 NRC at 617; see also Oconee, LBP-79-2, 9 NRC at 101. Even where a petitioner is denied judicial standing as of right, because, e.g., its interest is too “generalized” or “academic,” those factors can favor discretionary intervention. See Perry, LBP-91-38, 34 NRC at 248-50.

In this case, SSWS will make a valuable contribution to the proceeding because of the expertise of its members and the witnesses it proposes to call, because of the reputation of its members as nuclear scientists and administrators, and because of its lack of financial or political interest in the outcome. This last factor was demeaned by the Licensing Board majority as indicating that SSWS’s interest was merely “academic.” While SSWS has no interest in the ultimate outcome of the licensing proceeding, and in that sense may be said to be “academic,” it has a clear and important interest in seeing that all relevant and important information within its members’ fields of expertise are considered by the Licensing Board. That interest is, or should be a major, if not dominant, component of the “public interest” and development of the record. As Administrative Judge Lam recognized: “the broad knowledge and experience of the members of SSWS in nuclear science and technology would make a significant contribution to the development of a sound record...” Order at 171 (Dissenting Opinion).

The Licensing Board acknowledged that the backgrounds and credentials of the members of SSWS show “considerable expertise in a variety of scientific and engineering disciplines that are relevant to the issues raised in this proceeding.” Order at 37, but the majority minimized the contributions that would be made by SSWS by emphasizing their “lack of knowledge, understanding or concern about the particulars of the PFS application.” We respectfully submit that the Licensing Board ignored the capacity of SSWS and its members to “get up to speed” very quickly, given their

admitted expertise. Indeed, the Licensing Board excessively “front loaded” the requirements for intervention by explicitly expecting intervenors to come to the proceeding with detailed knowledge of specific elements of the application (and contentions of other parties) before an applicant-intervenor could know whether the investment of its time and effort would be of any benefit, because such expenditure would be frustrated if it were not permitted to intervene.

The Licensing Board acknowledged that the contentions submitted by of SSWS are unlikely to broaden the issues in the proceeding or delay the proceeding. Order at 38. Nevertheless, the majority “perceive[d] a not insubstantial risk that by the very nature of its more ‘academic’ interest and its own organizational structure, SSWS will broaden the issues or otherwise delay this proceeding....” (Order at 38-39). The majority acknowledged that the Licensing Board could avoid those problems by requiring SSWS to present a single organizational position under strict deadlines. The majority then speculates that such strictures might “impair” SSWS’s peer review practice and thus be deleterious to its [SSWS’s] stated goals. Order at 39. SSWS does not believe that reasonable restrictions on its manner of participation -- specifically a requirement that it speak with one voice and in a timely way -- would be deleterious to its goals. While SSWS is flattered by the Licensing Board’s concern for SSWS’s internal deliberative process, we believe that the Board’s concerns are unfounded. As it has indicated to the Licensing Board, SSWS seeks to act by consensus; if there is no consensus within SSWS, it will not take a position. Reasonable deadlines are also not a problem, as evidenced by the fact that SSWS was able to comply with the Board’s deadline for filing its Supplemental Petition.

Also important is the added confidence the proceeding will engender in the minds of the public if prominent scientists and former nuclear regulators -- who have no partisan “axe to grind” are allowed to be part of the process. Indeed, the refusal of the Licensing Board and the Commission

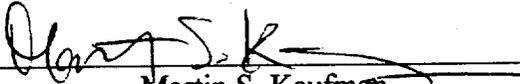
to allow intervention by SSWS could well convey to the public an image of a parochial and insular regulatory agency dominated by a group of special interests. We respectfully that allaying those fears is itself an important contribution to public confidence in the integrity of the nuclear facility licensing process, and is fully consistent with the statutory mandate of this agency.

CONCLUSION

For the foregoing reasons, Scientists for Secure Waste Storage respectfully requests that the Commission reverse the Licensing Board and grant SSWS's application to intervene.

Dated: New York, New York
May 1, 1998

Atlantic Legal Foundation
Attorneys for Scientists for
Secure Waste Storage

By: 
Martin S. Kaufman

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New York, NY 10017
(212) 573-1960

APPENDIX A

MEMBERS OF SCIENTISTS FOR SECURE WASTE STORAGE

Anders, William Alison

OCCUPATION(S): aerospace and defense manufacturing executive

BORN: Oct. 17, 1933 Hong Kong

EDUCATION:

BS, U.S. Naval Acad., Annapolis, 1955, MS in Nuclear Engring., U.S. Inst. Tech.,
Wright-Patterson, 1962

CAREER:

Commnd. 2d Lt., U.S. Air Force, 1955, pilot, engr., U.S. Air Force, 1955-69,
astronaut, NASA-Johnson Space Ctr., Houston, 1963-69, astronaut, Apollo 8, 1st
lunar flight, 1968, exec. sec., Nat. Aero. and Space Council, Washington, 1963-72
commr., AEC, Washington, 1973-74, chmn., Nuclear Regulatory Commn., 1975-76
U.S. Ambassador to Norway, 1976-77, v.p., gen. mgr. nuclear energy products div.,
Gen. Electric Co., 1977-80, v.p., gen. mgr. aircraft equipment div., Gen. Electric Co.,
1980-84, sr. exec., v.p. ops., Textron Inc., 1984-89, vice chmn., Gen. Dynamics, St.
Louis, 1990-91, chmn., CEO, Gen. Dynamics, 1991- , chmn. bd. dirs., N000, 1993-
, pres., Apogee Group.

CIVIC/MILITARY INFORMATION:

Trustee Battell Meml. Inst., Maj. gen. USAFR, 1983-88.

AWARDS:

Decorated various mil. awards; recipient Wright, Collier, Goddard and Arnold flight
awards; co-holder several world flight records.

Bethe, Hans Albrecht

OCCUPATION(S): physicist, educator

EDUCATION:

Goethe Gymnasium, Frankfurt on Main,
Goethe Gymnasium, U. Frankfort,
Ph.D., U. Munich, 1928
D.Sc., Bklyn. Poly. Inst., 1950, D.Sc., U. Denver, 1952, D.Sc., U. Chicago., 1953,
D.Sc., U. Birmingham, 1956, D.Sc., Harvard U., 1958

CAREER:

Instr. in theoretical physics, univs. of Frankfort, Stuttgart, Munich and Tubingen,
1928-33, lectr., univs. of Manchester and Bristol, Eng., 1933-35, asst. prof., Cornell
U., 1935, prof., Cornell U., 1937-75, prof. emeritus, Cornell U., 1975-

CAREER RELATED:

dir. theoretical physics div. Los Alamos Sci. Lab., 1943-46; Mem. Presdl. Study
Disarmament, 1958; mem. President's Sci. Adv. Com., 1956-60

Hans Albrecht Bethe (cont'd)

CREATIVE WORKS:

Author: Mesons and Fields, 1953, Elementary Nuclear Theory, 1957, Quantum Mechanics of One-and Two-Electron Atoms, 1957, Intermediate Quantum Mechanics, 1964; contbr. Handbuch der Physik, 1933, Revs. Modern Physics, 1936-37, Phys. Rev., Astrophys. Jour.

AWARDS:

Recipient A. Cressy Morrison prize N.Y. Acad. Sci., 1938-40; Presdl. Medal of Merit, 1946; Max Planck medal, 1953; Enrico Fermi award AEC, 1961; Nobel Prize in physics, 1967; Nat. Medal of Sci., 1976; Vannevar Bush award NSF, 1985; Einstein Peace prize Albert Einstein Peace Prize Found., 1993, Oersted prize Am. Assn. Physics Tchrs.

Bloembergen, Nicolaas

OCCUPATION(S): physicist, educator

EDUCATION:

BA, Utrecht U., 1941, MA, Utrecht U., 1943, PhD, Leiden U., 1948
MA (hon.), Harvard U., 1951, D of Sci. (hon.), Laval U., 1987, D of Sci. (hon.), U. Conn., 1988, D of Sci. (hon.), U. Hartford, 1991, D of Sci. (hon.), U. Ctrl. Fla., 1996, LHD (hon.), U. Mass., Lowell, 1994, LHD (hon.), U. Ctrl. Fla., 1996

CAREER:

teaching asst., Utrecht U., 1942-45, research fellow, Leiden U., 1948, mem. Soc. Fellows, Harvard U., 1949-51, assoc. prof., Harvard U., 1951-57, Gordon McKay prof. applied physics, Harvard U., 1957- , Rumford prof. physics, Harvard U., 1974, Gerhard Gade univ. prof., Harvard U., 1980, prof. emeritus, Harvard U., 1990

CAREER RELATED:

vis. prof. U. Paris, 1957, U. Calif., 1965, College de France, Paris, 1980; Lorentz guest prof. U. Leiden, 1973; Raman vis. prof. Bangalore, India, 1979; Fairchild Disting. scholar Calif. Inst. Tech., 1984; von Humboldt Sr. Scientist, Munich, Fed. Republic Germany; hon. prof. Fudan U., Shanghai, People's Republic of China; Disting. Vis. Prof. CREOL, U. Ctrl. Fla., 1995.

CREATIVE WORKS:

Author: Nuclear Magnetic Relaxation, 1948, Nonlinear Optics, 1965, Encounters in Magnetic Resonance, 1996, Encounters in Nonlinear Optics, 1996; also articles in profl. jours.

AWARDS:

Recipient Buckley prize for solid state physics Am. Phys. Soc., 1958, Dirac medal U. New South Wales (Australia), 1983, Stuart Ballantine medal Franklin Inst., 1961, Half Moon trophy Netherlands Club N.Y., 1972, Nat. medal of Sci., 1975, Lorentz medal Royal Dutch Acad., 1978, Frederic Ives medal Optical Soc. Am., 1979; von Humboldt sr. scientist award Munich, 1980, von Humboldt medal, 1989, Nobel prize in Physics, 1981; Guggenheim fellow, 1957.

Bromley, David Allan

OCCUPATION(S): physicist, engineer, educator

EDUCATION: BS in Engring. Physics, Queen's U., Kingston, 1948, MS in Physics, Queen's U., Kingston, 1950, PhD in Nuclear Physics, U. Rochester, 1952, MA (hon.), Yale U., 1961, D of Natural Philosophy (hon.), U. Frankfurt, 1978, Docteur (Physique) (hon.), U. Strasbourg, 1980, DSc (hon.), Queen's U., 1981, DSc (hon.), U. Notre Dame, 1982, DSc (hon.), U. Witwatersrand, 1982, DSc (hon.), Trinity Coll., 1988 LittD (hon.), U. Bridgeport, 1981, Dott. (hon.), U. Padua, 1983, LHD (hon.), U. New Haven, 1987, DSc (hon.), Rensselaer Polytechnic Inst., 1990, LHD (hon.), Ill. Inst. Tech., 1990, DSc (hon.), Lehigh U., 1991, DSc (hon.), Bklyn. Polytechnic Inst., 1991, DSc (hon.), U. Guelph, 1991, DSc (hon.), Fordham U., 1991, DSc (hon.), Northwestern U., 1991, DSc (hon.), Coll. of William and Mary, 1991, D Engring. Tech. (hon.), Wentworth Inst., 1991, DSc (hon.), SUNY, DSc (hon.), U. Mass., DSc (hon.), Adelphi U., 1993, DHL (hon.), Mt. Sinai Med. Ctr., 1993, D. Eng. (hon.), Colo. Sch. Mines, 1992, DSc (hon.), Fla. State U., 1993, DSc (hon.), Mich. State U., 1994

CAREER:

Oper. engr., Hydro Electric Power Commn. Ont., 1947-48, rsch. officer, Nat. Rsch. Coun. Can., 1948; instr., then asst. prof. physics, U. Rochester, 1952-55, sr. rsch. officer, sect. head, Atomic Energy Can. Ltd., 1955-60, assoc. prof. physics, asso. dir. heavy ion accelerator lab., Yale U., 1960-61, prof. physics, dir. A. W. Wright Nuclear Structure Lab., Yale U., 1961-89, chmn. physics dept., Yale U., 1970-77, Henry Ford II prof. physics, Yale U., 1972-93, Sterling prof. scis., dean engring., Yale U., New Haven, 1994- , asst. to Pres. for sci. and tech., Washington, 1989-93, dir., Office of Sci. and Tech. Policy, Washington, 1989-93, chmn., Pres.'s Coun. Advisers on Sci. and Tech., Washington, 1989-93, chmn., Fed. Coordinating Coun. Sci., Engring. and Tech., Washington, 1989-93, chmn., Nat. Critical Materials Coun., Washington, 1990-92

CAREER RELATED:

cons. Brookhaven, Argonne, Berkley and Oak Ridge Nat. Labs., Bell Telephone Labs., IBM, GTE; mem. panel nuclear physics Nat. Acad. Scis., 1964, chmn. com. on nuclear sci., 1966-74, chmn. physics survey, 1969-74; mem.-at-large, mem. exec. com. divsn. phys. scis. NRC, 1970-74, mem. exec. com., assembly phys. and math. scis., 1974-78, mem. naval sci. bd., 1974-78; mem. high energy physics adv. panel ERDA, 1974-78; mem. nuclear sci. adv. panel NSF and Dept. Energy, 1980-89; mem. White House Sci. Coun., 1981-89, Nat. Sci. Bd., 1988-89; bd. dirs. MBARI, Monterey, Calif., Echlin Inc., New Haven, Sci. Applications Internat., Paris.

CREATIVE WORKS:

Editor: Physics in Perspective, 5 vols, 1972, Large Electrostatic Accelerators, 1974, Nuclear Detectors, 1978, Heavy Ion Science, 8 vols, 1981-84; co-editor: Procs. Kingston Internat. Conf. on Nuclear Structure, 1960, Facets of Physics, 1970, Nuclear Science in China, 1979, The President's Scientists: Reminiscences of a Presidential Science Advisor, 1993; assoc. editor: Annals of Physics, 1968-89, Am. Scientist, 1969-81, Il Nuovo Cimento, 1970-89, Nuclear Instruments and Methods, 1974-89, Science, Technology and the Humanities, 1978-89, Jour. Physics, 1978-89, Nuclear Science Applications, 1978-89, Technology in Soc, 1981-89; cons. editor: McGraw Hill Series in Fundamentals of Physics, 1967-89, McGraw Hill Ency. Sci. and Tech.

David Allen Bromley (cont'd)

CIVIC/MILITARY INFORMATION:

Bd. dirs. Oak Ridge Assoc. Univs., 1977-80, U. Bridgeport, 1981-86, Sheffield Scientific Sch., 1995-.

AWARDS:

Recipient medal Gov. Gen. Can., 1948, Disting. Alumnus award U. Rochester, 1986, U.S. Nat. medal of sci., 1988, Presdl. medal N.Y. Acad. Scis., 1989, Yale medal in sci. and engring., 1991, Disting. Svc. award IEEE, 1991, Louis Pasteur medal of sci. U. Strasbourg, 1991, Harvey medal Pierce Found., 1991, Disting. Svc. medal NSF, 1992, Pub. Svc. medal Ctr. Study of Presidency, 1992, Exec. Yr. award R&D Mag., 1992, Disting. Scholar medal U. Rochester, 1993; decorated Commander's Cross Order of Merit, Fed. Rep. Germany, 1993; NRC fellow, 1952; fellow Timothy Dwight Coll., 1961-; Guggenheim fellow, 1977-78; Humboldt fellow, 1978, 85, 96; Benjamin Franklin fellow Royal Soc. Arts, London, 1979-.

Carbon, Max William

OCCUPATION(S): nuclear engineering educator

EDUCATION: BSME, Purdue U., 1943, MS, Purdue U., 1947, PhD, Purdue U., 1949

CAREER:

with, Hanford Works divsn. GE, 1949-55, head heat transfer unit, Hanford Works divsn. GE, 1951-55, with rsch. and advanced devel. divsn., Avco Mfg. Corp., 1955-58, chief thermodynamics sect., Avco Mfg. Corp., 1956-58, prof., chmn. nuclear engring. and engring. physics dept., U. Wis. Coll. Engring., Madison, 1958-92, emeritus prof., collateral faculty, U. Wis. Coll. Engring., Madison, 1992- , acting assoc. dean for rsch., U. Wis. Coll. Engring., Madison, 1995-96,

CAREER RELATED:

group leader Ford Found. program Singapore, 1967-68; mem. adv. com. on reactor safeguards, 1975-87; chmn. spl. com. for integral fast reactor U. Chgo., 1984-94, chmn. spl. adv. com. for nuclear tech. program Argonne (Ill.) Nat. Lab., 1995-; mem. INPO Nat. Nuclear Accrediting Bd., 1990-94; mem. nuclear safety rev. and audit com. Kewaunee Nuclear Power Plant, 1993-96.

CIVIC/MILITARY INFORMATION:

Capt. ordnance dept. AUS, 1943-46.

AWARDS:

Named Disting. Engring. Alumnus, Purdue U.

Church, Bruce W.

Bruce W. Church formerly the Assistant Manager for Environment, Safety, Security and Health for the Nevada Operations Office of the U.S. Dept. of Energy is presently affiliated with the Desert Research Institute of the University of Nevada as a Senior Research Physicist, as Adjunct Research Professor of Health Physics, University of Cincinnati and is President of BWC Enterprises, Inc. He has served as Health Physics Advisor to the Department of Primary Industries and Energy, Government of Australia on remedial actions since 1986 and is currently serving as a member of the Maralinga Rehabilitation Technical Advisory Committee (MARTAC). Mr. Church served as Co-Chairperson of the Risk Team, Office of Integrated Risk Management, Environmental

Bruce W. Church (cont'd)

Management (EM), U.S. Dept. of Energy (1995) and continues to serve as a senior advisor to DOE/EM's "office of Science and Risk Policy".

Mr. Church has been involved with and managed many radiological remedial action projects over the last 25 years, e.g., Enewetak, Hattiesburg, Miss., Rulison & Rio Blanco in Colo., Gnome and Gasbuggy in New Mexico and at the Nevada Test Site (NTS). He also managed DOE/NV's "offsite Dose Reassessment Program" and initiated the Low Level Waste Management Program during the mid-seventies at the NTS.

Mr. Church is a Southern Utah Native and holds an Associate Degree in Physical Science from Dixie Jr. College, St. George, UT (1960), a Bachelor of Science Degree in Molecular and Radiobiology from the University of Utah, Salt Lake City, UT (1965), and a Master of Science Degree in Radiological Health from Colorado State University, Fort Collins, Colo. (1966). He has worked and resided in Southern Nevada for the last 31 years.

Cohen, Bernard Leonard

OCCUPATION(S): physicist, educator

BORN: Jun. 14, 1924 Pitts.

EDUCATION: B.S., Case Inst. Tech., 1944, M.S., U. Pitts., 1948, D.Sc., Carnegie Inst. Tech., 1950

CAREER:

With, Oak Ridge Nat. Lab., 1950-58, prof. physics, U. Pitts., 1958-94, prof. emeritus, U. Pitts., 1994- , also adj. prof. chemistry, chem. engring., radiation health, U. Pitts., environ. and occupl. health, U. Pitts., dir., Sarah Mellon Scaife Nuclear Physics Lab., 1965-78.

CAREER RELATED:

on leave with Gen. Atomic Lab., San Diego, 1959-60, Inst. for Def. Analysis, Washington, 1962, Brookhaven Nat. Lab., 1965, Los Alamos Sci. Lab., 1969, Inst. Energy Analysis, Oak Ridge, 1974-75, Argonne Nat. Lab., 1978-79; cons. numerous govtl. agys. and pvt. corps.

CREATIVE WORKS:

Author: Heart of the Atom, 1967, Concepts of Nuclear Physics, 1971, Nuclear Science and Society, 1974, Before It's Too Late: A Scientist's Case for Nuclear Power, 1983, A Homeowner's Guide to Radon, 1987, The Nuclear Energy Option: Alternative For The Nineties, 1990; contbr. numerous articles to profl. jours.

Debreu, Gerard

OCCUPATION(S): economics and mathematics educator

EDUCATION:

student, Ecole Normale Superieure, Paris, 1941-44, student, Agrege de l'Universite, France, 1946, DSc, U. Paris, 1956, Dr. Rerum Politicarum honoris causa, U. Bonn, 1977, D. Scis. Economiques (hon.), U. Lausanne, 1980, DSc (hon.), Northwestern U., 1981,

Dr. honoris causa, U. des Scis. Sociales de Toulouse, 1983, Dr. honoris causa, Yale U., 1987, Dr. honoris causa, U. Bordeaux I, 1988

Gerard Debreu (cont'd)

CAREER:

rsch. assoc., Centre Nat. De La Recherche Sci., Paris, 1946-48, Rockefeller fellow, U.S., Sweden and Norway, 1948-50, rsch. assoc., Cowles Commn., U. Chgo., 1950-55, assoc. prof. econs., Cowles Found., Yale, 1955-61, fellow, Ctr. Advanced Study Behavioral Scis., Stanford U., 1960-61, vis. prof. econs., Yale U., full prof. econs., U. Calif., Berkeley, 1962- , prof. Miller Inst. Basic Rsch. in Sci., U. Calif., Berkeley, 1973-74, prof. math., U. Calif., Berkeley, 1975- , univ. prof., U. Calif., Berkeley, 1985-

CAREER RELATED:

Guggenheim fellow, vis. prof. Ctr. Ops. Rsch. and Econometrics, U. Louvain, 1968-69, vis. prof., 1971, 72, 88; Erskine fellow U. Canterbury, Christchurch, New Zealand, 1969, 87, vis. prof., 1973; Overseas fellow Churchill Coll., Cambridge, Eng., 1972; Plenary address Internat. Congress Mathematicians, Vancouver, 1974; vis. prof. Cowles Found. for Rsch. in Econs., Yale U., 1976; vis. prof. U. onn, 1977; rsch. assoc. Cepremap, Paris, 1980; faculty rsch. lectr. U. Calif., Berkeley, 1984-85, univ. prof., 1985-, Class of 1958 Chair, 1986- ; vis. prof. U. Sydney, Australia, 1987; lectr. in field.

CREATIVE WORKS:

Author: Theory of Value, 1959, Mathematical Economics: Twenty Papers of Gerard Debreu, 1983; assoc. editor Internat. Econ. Rev., 1959-69; mem. editorial bd. Jours. Econ. Theory, 1972-, SIAM Jours. on Applied Math., 1976-79, Jours. of Complexity, 1985-, Games and Econ. Behavior, 1989-, Econ. Theory, 1991; mem. adv. bd. Jours. Math. Econs., 1974-; correspondent Math. Intelligencer, 1983-84.

CIVIC/MILITARY INFORMATION:

Served with French Army, 1944-45.

AWARDS:

Decorated Chevalier de la Legion d'Honneur, Commandeur de l'Ordre National du Merite, Officier Le Legion d'Honneur; recipient Nobel Prize in Econ. Scis., 1983, Berkeley Citation, 1991; sr. U.S. Sci. awardee Alexander von Humboldt Found., 1977.

Glashow, Sheldon Lee

OCCUPATION(S): physicist, educator

EDUCATION: AB, Cornell U., 1954, AM, Harvard U., 1955, PhD, Harvard U., 1958, DSc (hon.), Yeshiva U., 1978, DSc (hon.), U. Marseille, 1982, DSc (hon.), Adelphi U., 1989, DSc (hon.), Bar Ilan U., 1989, DSc (hon.), Gustave Adolphus Coll., 1989.

CAREER:

NSF fellow, U. Copenhagen, Denmark, 1958-60, rsch. fellow, Calif. Inst. Tech., 1960-61, asst. prof., Stanford U., 1961-62, asst. prof., assoc. prof., U. Calif. at Berkeley, 1962-66 mem. faculty, Harvard U., 1966- , prof. physics, Harvard U., 1967- , Higgins prof. physics, Harvard U., 1979- , Mellon prof. scis., Harvard U., 1988- , disting. vis. scientist, Boston U., 1984- .

CAREER RELATED:

cons. Brookhaven Nat. Lab., 1966-73, 75-; mem. sci. policy com. CERN, 1979-84; vis. prof. U. Marseille, 1971, MIT, 1974-80, Boston U., 1983; affiliated sr. scientist U. Houston, 1983-; univ. scholar Tex.A&M U., 1983-86.

Sheldon Lee Glashow (cont'd)

CREATIVE WORKS:

Author: (with Ben Bova) Interactions, 1988, Charm of Physics, 1990, From Alchemy to Quarks, 1994; contbr. articles to prof. journ. and popular mags.; founding editor Quantum mag., 1989-.

CIVIC/MILITARY INFORMATION: Pres. Andrei Sakharov Inst., 1980-85, Nat. Com. for Excellence in Edn., 1985-88.

AWARDS:

Recipient J.R. Oppenheimer Meml. prize, 1977, George Ledlie prize, 1978, Nobel prize in physics, 1979, Castiglione di Sicilia prize, 1983, Erice Sci. for Peace prize, 1991; NSF fellow, 1955-60, Sloan fellow, 1962-66, CERN vis. fellow, 1968.

Hoffman, Robert James

EDUCATION: B.S. Physics, Math Minor, University of Utah (1971), M.S. Physics (Medical Radiation). University of Utah (1973)

PROFESSIONAL POSITIONS:

University of Utah, Salt Lake City, Utah - 7/75 to 4/78, Health Physicist - Varied health physics responsibilities in support of an NRC license of broad scope, responsible for all analytical x-ray safety and surveys, responsible for medical x-rays surveys at the VAMC. Yale-New Haven Hospital, New Haven, CT - 5/78 to 6/81, Radiation Safety Officer Responsible for a broad medical radioactive materials programs and license. responsible for radiation safety for therapy and diagnostic x-ray units, Yale University, Department of Radiation Oncology, New Haven, CT 5/78 to 6/81 -Lecturer Taught health physics and radiation safety to technician and dosimetry students and Radiation Oncology Residents, University of Utah, Salt Lake City, UT - 7/81 to 3/82, Health Physicist - varied health physics responsibilities in support of an NRC/BRC license of broad scope, responsible for all analytical x-ray safety and surveys, (applies to the next two positions as well), University of Utah, Salt Lake City, UT - 4/82 to 11/82, Radiation Safety Officer and Acting Director of Radiological Health, University of Utah, Salt Lake City, UT - 12/82 to 8/89, Health Physicist, Veterans Affairs Medical Center, Salt Lake City, UT - 8/89 to present, Radiation Safety Officer - Responsible for all radiation safety support of an NRC medical license of broad scope, responsible for medical x-rays for medical x-ray surveys and safety.

CERTIFICATION, LICENSE & QUALIFIED EXPERT:

Certified by the American Board of Health Physics - 1981, Re-recertified through 1989, 1993, and 1997. Listed with the Division of Radiation Control for the State of Utah as a Qualified Expert in the areas Diagnostic X-Ray, Industrial Radiography and Radiation Therapy (Shielding and radiation safety only). Licensed Medical Physicist (State of Texas) in Diagnostic Radiological Physics and Medical Health Physics. Utah Radiation Control Board approved as a Mammography Imaging Medical Physicist. Issued June 1, 1997.

ADVISORY APPOINTMENTS:

Chairman of Radiation Control Board for the Department of Environmental Quality for the State of Utah - (April 1995 to July 1997). Appointed as a member of the Radiation Control Board for the Department of Environmental Quality for the State of Utah (1991 through July 1998), Member of Radiation Technical Advisory Committee to the Bureau of Radiation Control for State of Utah 1982 to 1986, Re-

Robert J. Hoffman (cont'd)

appointed to one year term in December of 1986. Radiation Safety Committee and Radioactive Drug Research Committee - University of Utah - 1981 to Present, Health Physics Society.

PUBLICATIONS:

Hoffman, R.J. Nath R. On the Sources of Radiation Exposure of Technologists in Radiotherapy Center with High Energy x-ray Accelerators Health Physics 42.525 ., Hoffman, R.J. Report of Methodology of Calibration and Irradiation of Samples with the UDM cs Beam irradiator at the University of Utah. US Japan Joint Reassessment of Atomic Bomb Radiation Dosimetry in Hiroshima and Nagasaki FINAL REPORT Volume 2 (appendix to Vol. 1) DS86.

Kammen, Daniel Merson

OCCUPATION(S): environmental physicist, researcher

EDUCATION: BA, Cornell U., 1984, MA, Harvard U., 1986, PhD, Harvard U., 1988

CAREER:

Weizmann postdoctoral fellow, Calif. Inst. Tech., Pasadena, 1988-91, with physics dept. Ctr. Global Environ. Change, Harvard U., Cambridge, Mass., 1991-93, asst. prof. Pub. and Internat. Affairs, Princeton (N.J.) U., 1993-

CAREER RELATED:

cons. devel. program UN, Washington, 1989-; dir. Earthwatch, Kenya.

CREATIVE WORKS:

Contbr. over 40 articles on renewable energy, tech. policy and devel.

CIVIC/MILITARY INFORMATION:

Tech. vol. Operation USA, 1988-1991.

AWARDS:

Recipient 21st Century award The Global Indsl. and Social Progress Inst., 1993.

RESEARCH INTERESTS/SPECIAL ACHIEVEMENTS:

Achievements include patents pending for Solar Ovens for developing countries.

Landis, John William

OCCUPATION(S): engineering and construction executive, government advisor

EDUCATION: BS in Engring. Physics summa cum laude, Lafayette Coll., Easton, PA, 1939, ScD (hon.), Lafayette Coll., Easton, PA 1960

CERTIFICATION: Registered prof. engr., Calif.

CAREER:

research engr., Eastman Kodak Co., Rochester, N.Y., 1939-43, cons., Navy Dept., Washington, 1946-50, head sci. and engring. dept., Ednl. Testing Service, Princeton, N.J., 1948-50, reactor engr., AEC, Washington, 1950-53, dir. customer relations atomic energy div., Babcock & Wilcox Co., N.Y.C., 1953-55, asst. mgr. atomic energy div., Babcock & Wilcox Co., Lynchburg, Va., 1955-62, mgr. atomic energy div., Babcock & Wilcox Co., Lynchburg, Va., 1962-65, gen. mgr. Washington ops., Babcock & Wilcox Co., 1965-68, regional v.p., Gulf Gen. Atomic Co., Washington, 1968-69, group v.p., Gulf Gen. Atomic Co., LaJolla, Calif., 1969-70, pres., dir. subs., Gulf Gen. Atomic Co., LaJolla, Calif., 1970-74, pres., Power Systems Co., Gen. Atomic Partnership, LaJolla, Calif., 1974-75, sr. v.p., dir., pres. subs., Stone & Webster Engring. Corp., Boston, 1975-92, pvt. cons., Stone & Webster Engring. Corp., Boston, 1992.

John William Landis (cont'd)

CAREER RELATED:

founding dir. Cen. Fidelity Banks, Inc., Richmond, Va.; founding gov. Nat. Materials Property Data Network, Inc., Phila.; chmn. adv. com. isotopes and radiation devel. and four other adv. coms. AEC, Washington, 1957-70; chmn. coms., co. rep. Atomic Indsl. Forum (now U.S. Nuclear Energy Inst.), Washington, 1953-; mem. N.Y. State Adv. Com. on Atomic Energy, 1956-59, Va. State Adv. Com. on Nuclear Energy, 1959-68; vice chmn. mgmt. com. Nat. Environ. Studies Project, Washington, 1974-89; dir., v.p., pres., chmn. bds. and coms., trustee Internat. Fund, Am. Nat. Standards Inst., N.Y.C., 1957-; vice chmn. ISO-9000 Registration Com.; dir., chmn. Fusion Power Assocs., Gaithersburg, Md., 1981-; chmn. U.S. Fusion Industry Coun., Internat. Thermonuclear Exptl. Reactor Industry Coun., 1994-; chmn. com. on energy-related atmospheric pollution World Energy Conf., London, 1984-90, N.Am. coord. global energy study, 1989-93; dir., chmn. com. on protection of environ. U.S. Energy Assn., Washington, 1981-; mem. fusion adv. panel U.S. Ho. Reps., Washington, 1979-87; charter mem. magnetic fusion adv. com. U.S. Dept. Energy, Washington, 1982-84, chmn. internat. rsch. and devel. panel, chmn. civilian nuclear power panel, vice chmn., chmn. energy rsch. advisory bd., 1984-90; mem. adv. bd. Sec. of Energy, 1990-93, fusion energy adv. com., 1994-; advisor Carnegie-Mellon U., Pitts., 1971-73, Pa. State U., State College, 1980-83, U. Calif. San Diego, 1974-82; vis. and sustaining fellow MIT, Cambridge, 1971-90; chmn. bus. administrn. adv. bd. U. San Diego, 1972-75; chmn. engrng. adv. com. Lafayette Coll., 1988-.

CREATIVE WORKS:

Co-author: six books; contbr. articles to profl. and trade jours.

CIVIC/MILITARY INFORMATION:

Trustee, chmn. Randolph-Macon Woman's Coll., Lynchburg, Va., 1963-; trustee Lafayette Coll., Easton, Pa., 1962-, Va. Poly. Inst. and State U., Blacksburg, 1966-70; bd. dirs. Va. Poly. Inst. Ednl. Found., Blacksburg, 1968-; mem. U. Calif. Pres.'s Coun. on the Nat. Labs., 1993-; chmn. MIT Reactor Com., 1995-; mem. Sr. Rev. Group, Amarillo Nat. Resource Ctr. for Plutonium, 1994-; mem. Va. Adv. Bd. on Indsl. Devel. and Planning, Richmond, 1962-72; bd. dirs. Va. Engrng. Found., Charlottesville, 1962-65; trustee Seven Hills Sch., Lynchburg, Va., 1960-65; dir. Harvard U. Ctr. for Blood Rsch., 1992-; mem. Mayor's Com. on Energy, San Diego, 1973-75; chmn., mem. six coms. Nat. Rsch. Coun., 1976-. Served to lt. USN, 1943-46, ETO.

AWARDS:

Decorated Letter of Commendation, two battle stars; recipient Gen. of Industry award State of Okla., 1971, George Washington Kidd award, Joseph E. Bell award Lafayette Coll., Lehigh Valley Favorite Son award State of Pa., 1976, Dwight D. Eisenhower Award of Honor, 1990, Winston Churchill Medal of Wisdom, 1988, Disting. Career award Fusion Power Assocs., 1991, Howard Coonley medal Am. Nat. Standards Inst., 1991, Exceptional Pub. Svc. award U.S. Dept. Energy, 1992, Henry DeWolf Smyth Nuclear States award Am. Nuclear Soc. and Nuclear Energy Inst., 1996; named Hon. Citizen City of Dallas, 1973, Alumni fellow Lafayette Coll., 1984; elected to Soc. d'Honneur Lafayette Coll., 1989; elected to Wisdom Hall of Fame, 1987.

Ramsey, Norman F.

EDUCATION: Norman Ramsey received his A.B. and M.A. from Columbia University and similar degrees from Cambridge University. In 1940 he received a Ph.D. from Columbia University for molecular beam studies with I. I. Rabi. He was awarded an Sc.D. by Cambridge University in 1954 and by Oxford University in 1973 as well as honorary D.Sc.'s from Middlebury, Lake Forest and Carleton Colleges and from Case Western Reserve, Rockefeller, Chicago, Houston and Michigan Universities.

CAREER:

After temporary periods at the Carnegie Institution of Washington, the University of Illinois, the MIT Radiation Laboratory and Los Alamos, he became an Associate Professor at Columbia University. He was Executive Secretary of the group scientists who established Brookhaven National Laboratory and was the first Chairman of its Physics Department. Since 1947 he has been at Harvard University where he is Higgins Professor of Physics. Norman Ramsey's experimental work has ranged from molecular beams to particle physics and has concentrated on precision measurements of the electric and magnetic properties of nucleons, nuclei, atoms and molecules. He and his associates discovered the deuteron electric quadrupole moment, have studied proton-proton and electron-proton scattering and have measured many nuclear magnetic moments including those of the proton, neutron, and deuteron. He has studied nuclear interactions in molecules and the electron distribution within molecules, has proposed the first successful theories of the chemical shift in NMR and of the electron coupled spin-spin interactions in molecules and has developed the theory of thermodynamics at negative absolute temperatures. He and his associates have invented high precision methods of molecular beam spectroscopy including the atomic hydrogen maser and have set low limits to the electric dipole moment of the neutron as a test of time reversal symmetry. He and his associates observed for the first time parity non-conserving spin rotations of neutrons passing through matter. Norman Ramsey's books include Experimental Nuclear Physics, Nuclear Moments, Molecular Beams and Quick Calculus.

AWARDS:

Norman Ramsey has been a Guggenheim Fellow, was the George Eastman Professor at Oxford University in 1973-74 and visiting professor at Middlebury, Mount Holyoke and Williams Colleges and at Virginia, Colorado, Chicago and Michigan Universities. He was Chairman of the Physics Section of the American Association for the Advancement of Science 1977-78 and President of the American Physical Society 1978-79. From 1966-81 he was President of Universities Research Association, which operates the Fermi National Accelerator Laboratory. He was a Trustee of the Carnegie Endowment for International Peace and of Rockefeller University. From 1980 to 1986 he was Chairman of the Board of Governors of the American Institute of Physics and from 1985 to 1988 he was President of the national Phi Beta Kappa Society. He has received the Presidential Certificate of Merit, E. O. Lawrence Award, Davisson-Germer Prize, Columbia Award for Excellence in Science, IEEE Centennial Medal, IEEE Medal of Honor, Monie Ferst Award, Rabi Prize, Rumford Premium, Compton Medal, Oersted Medal, Pupin Medal, Erice Science for Peace Prize, Einstein Prize for Laser Science, Erice Science for Peace Prize, Vannevar Bush Award, Alexander Hamilton Award, National Medal of Science and the Nobel Prize in Physics.

Rowden, Marcus Aubrey

OCCUPATION(S): lawyer, former government official

EDUCATION:

B.A. in Econs, U. Mich., Ann Arbor, 1950, J.D. with distinction, U. Mich., Ann Arbor, 1953.

CERTIFICATION: Bar: Mich. 1953, D.C. 1978

CAREER:

trial atty., Dept. Justice, 1953-58, legal advisor, U.S. Mission to European Communities, 1959-62, solicitor, assoc. gen. counsel, gen. counsel, AEC, 1965-74, commr., chmn., U.S. NRC, Washington, 1975-77, partner, Fried, Frank, Harris, Shriver and Jacobson, Washington, 1977-

CIVIC/MILITARY INFORMATION:

Served with AUS, 1946-47.

AWARDS:

Decorated officer Order Legion of Honor Republic of France; Recipient Disting. Service award AEC, 1972

Seaborg, Glenn Theodore

OCCUPATION(S): chemistry educator

EDUCATION: AB, UCLA, 1934, PhD, U. Calif.-Berkeley, 1937, numerous hon. degrees, LLD, U. Mich., 1958, LLD, Rutgers U., 1970, DSc, Northwestern U., 1954, DSc, U. Notre Dame, 1961, DSc, John Carroll U., DSc, Duquesne U., 1968, DSc, Ind. State U., 1969, DSc, U. Utah, 1970, DSc, Rockford Coll., 1975, DSc, Kent State U., 1975, LHD, No. Mich. Coll., 1962, DPS, George Washington U., 1962, DPA, U. Puget Sound, 1963, LittD, Lafayette Coll., 1966, DEng, Mich. Technol. U., 1970, ScD, U. Bucharest, 1971 ScD, Manhattan Coll., 1976, ScD, U. Pa., 1983, PhD, U. Paris, 1996.

CAREER:

rsch. chemist, U. Calif., Berkeley, 1937-39, instr. dept. chemistry, U. Calif., Berkeley, 1939-41, asst. prof., U. Calif., Berkeley, 1941-45, prof., U. Calif., Berkeley, 1945-71, univ. prof., U. Calif., Berkeley, 1971- , leave of absence, U. Calif., Berkeley, 1942-46, dir. nuclear chem. research, U. Calif., Berkeley, 1946-58, asso. dir. Lawrence Berkeley Lab., U. Calif., Berkeley, 1954-61, chancellor Univ., (U. Calif.-Berkeley), Berkeley, 1958-61, dir. Lawrence Hall of Sci., U. Calif., Berkeley, 1982-84, chmn. Lawrence Hall of Sci., U. Calif., Berkeley, 1984- , sect. chief metall. lab., U. Chgo., 1942-46, chmn., AEC, 1961-71, gen. adv. com., AEC, 1946-50, research nuclear chemistry and physics, transuranium elements.

CAREER RELATED:

chmn. bd. Kevex Corp., Burlingame, Calif., 1972-87, Advanced Physics Corp., Irvine, Calif., 1988-94; mem. Pres.'s Sci. Adv. Com., 1959-61; mem. nat. sci. bd. NSF, 1960-61; mem. Pres.'s Com. on Equal Employment Opportunity, 1961-65, Fed. Radiation Council, 1961-69, Nat. Aeros. and Space Council, 1961-71, Fed. Council Sci. and Tech., 1961-71, Nat. Com. Am.'s Goals and Resources, 1962-64, Pres.'s Com. Manpower, 1964-69, Nat. Council Marine Resources and Engring. Devel., 1966-71; chmn. Chem. Edn. Material Study, 1959-74, Nat. Programming Council for Pub. TV, 1970-72; dir. Ednl. TV and Radio Center, Ann Arbor, Mich., 1958-64, 67-70; pres. 4th UN Internat.

Glenn Theodore Seaborg (cont'd)

Conf. Peaceful Uses Atomic Energy, Geneva, 1971, also chmn. U.S. del., 1964, 71; U.S. rep. 5th-15th gen. confs. IAEA, chmn., 1961-71; chmn. U.S. del. to USSR for signing Memorandum Cooperation Field Utilization Atomic Energy Peaceful Purposes, 1963; mem. U.S. del. for signing Limited Test Ban Treaty, 1963; mem. commn. on humanities Am. Council Learned Socs., 1962-65; mem. sci. adv. bd. Robert A. Welch Found., 1957-; mem. Internat. Orgn. for Chem. Scis. in Devel., UNESCO, 1981-92, pres., 1981-92, pres. emeritus, 1992-; mem. Nat. Commn. on Excellence in Edn., Dept. Edn., 1981-83; co-discoverer elements 94-102 and 106: plutonium, 1940, americium, 1944-45, curium, 1944, berkelium, 1949, californium, 1950, einsteinium, 1952, fermium, 1953, mendelevium, 1955, nobelium, 1958, seaborgium, 1974; co-discoverer nuclear energy isotopes Pu-239, U-233, Np-237, other isotopes including I-131, Fe-59, Te-99m, Co-60; originator actinide concept for placing heaviest elements in periodic system.

CREATIVE WORKS:

Author: (with Joseph J. Katz) *The Actinide Elements*, 1954, *The Chemistry of the Actinide Elements*, 1957, (with Joseph J. Katz and Lester R. Morse) 2d ed. Vols. I & II, 1986, *The Transuranium Elements*, 1958, (with E.G. Valens) *Elements of the Universe*, 1958 (winner Thomas Alva Edison Found. award), *Man-Made Transuranium Elements*, 1963, (with D.M. Wilkes) *Education and the Atom*, 1964, (with E.K. Hyde, I. Perlman) *Nuclear Properties of the Heavy Elements*, 1964, (with others) *Oppenheimer*, 1969, (with Ben Loeb) *Stemming the Tide*, 1987, (with W.R. Corliss) *Man and Atom*, 1971, *Nuclear Milestones*, 1972, (with Ben Loeb) *Kennedy, Khrushchev and the Test Ban*, 1981, (with Walt Loveland) *Elements beyond Uranium*, 1990, (with Ben Loeb) *The Atomic Energy Commission Under Nixon*, 1992, (with Ray C. Colvig) *Chancellor at Berkeley*, 1994, (with Ronald L. Kathren, Jerry B. Gough, Gary T. Benefiel) *The Plutonium Story: The Journals of Professor Glenn T. Seaborg 1939-1946*, 1994; editor: *Transuranium Elements: Products of Modern Alchemy*, 1978, (with W. Loveland) *Nuclear Chemistry*, 1982, *Modern Alchemy: The Selected Papers of Glenn T. Seaborg*, 1994, *A Scientist Speaks Out: A Personal Perspective on Science and Society*, 1996; assoc. editor *Jour. Chem. Physics*, 1948-50; mem. editorial adv. bd. *Jour. Inorganic and Nuclear Chemistry*, 1954-82, *Indsl. Rsch., Inc*, 1967-75; mem. adv. bd. *Chem. and Engring. News*, 1957-59; mem. editorial bd. *Jour. Am. Chem. Soc.*, 1950-59, *Ency. Chem. Tech.*, 1975-, *Revs. in Inorganic Chemistry*, 1977-; mem. hon. editorial adv. bd. *Internat. Ency. Phys. Chemistry and Chem. Physics*, 1957-, *Nuclear Sci. and Techniques*, *Chinese Nuclear Soc.*, 1989-; mem. panel *Golden Picture Ency. for Children*, 1957-61; mem. cons. and adv. bd. *Funk and Wagnalls Universal Standard Ency*, 1957-61; mem. *Am. Heritage Dictionary Panel Usage Cons.*, 1964-80; contbr. articles to prof. jours.

CIVIC/MILITARY INFORMATION:

Trustee *Pacific Sci. Ctr. Found.*, 1962-77, *Sci. Svc.*, 1965, pres., 1966-88, chmn., 1988-95; trustee *Am.-Scandinavian Found.*, 1968-, *Ednl. Broadcasting Corp.*, 1970-72; bd. dirs. *Swedish Coun. Am.*, 1976-, chmn. bd. dirs., 1978-82; bd. dirs. *World Future Soc.*, 1969-, *Calif. Coun. for Environ. and Econ. Balance*, 1974-83; bd. gov. *Am. Swedish Hist. Found.*, 1972-; sr. tech. rev. group *Amarillo Nat. Resource Ctr. for Plutonium*, 1995-.

Glenn Theodore Seaborg (cont'd)

MEMBERSHIPS AND AWARDS:

Decorated officier Legion of Honor (France); recipient John Ericsson, Gold medal Am. Soc. Swedish Engrs., 1948; Nobel prize for Chemistry, (with E.M. McMillan), 1951, John Scott award and medal City of Phila., 1953, Perkin medal Am. sect. Soc. Chem. Industry, 1957, U.S. AEC Enrico Fermi award, 1959, Joseph Priestley Meml. award Dickinson Coll., 1960, Sci. and Engring. award Fedn. Engring. Socs., Drexel Inst. Tech., Phila., 1962; named Swedish Am. of Year, Vasa Order of Am., 1962; Franklin medal Franklin Inst., 1963; 1st Spirit of St. Louis award, 1964; Leif Erikson Found. award, 1964; Washington award Western Soc. Engrs., 1965; Arches of Sci. award Pacific Sci. Center, 1968; Internat. Platform Assn. award, 1969; Prometheus award Nat. Elec. Mfrs. Assn., 1969; Nuclear Pioneer award Soc. Nuclear Medicine, 1971; Oliver Townsend award Atomic Indsl. Forum, 1971; Disting. Honor award U.S. Dept. State, 1971; Golden Plate award Am. Acad. Achievement, 1972, Daniel Webster medal, 1976, John R. Kuebler award Alpha Chi Sigma, 1978; Founders medal Hebrew U. Jerusalem, 1981; Great Swedish Heritage award, 1984, Ellis Island Medal of Honor, 1986, Seaborg medal UCLA, 1987, Vannevar Bush award NSF, 1988, Nat. Medal of Sci. NSF, 1991, Royal Order of the Polar Star Sweden, 1992, Profl. Fraternity Assn. Career Achievement award, 1993; Minor Planet 4856-Asteroid Seaborg named in his honor, 1995, Fellow Am. Phys. Soc., Am. Inst. Chemists (Pioneer award 1968, Gold medal award 1973), Chem. Soc. London (hon.), Royal Soc. Edinburgh (hon.), Am. Nuclear Soc. (hon. chair Spl. Panel on Protection and Mgmt. of Plutonium 1994-), Henry DeWolf-Smyth award 1982, Seaborg award 1984, hon. chair Spl. Panel on Protection and Mgmt. of Plutonium 1994-95), Am. Nuclear Soc., Calif. Acad. Scis., N.Y. Acad. Scis., Washington Acad. Scis., AAAS (pres. 1972, chmn. bd. 1973), Royal Soc. Arts (Eng.), mem. Am. Chem. Soc. (award in pure chemistry 1947, William H. Nichols medal N.Y. sect. 1948, Charles L. Parsons award 1964, Gibbs medal Chgo. sect. 1966, Madison Marshall award No. Ala. sect. 1972, Priestley medal 1979, pres. 1976, George C. Pimentel award in chem. edn., 1994), Am. Philos. Soc., Royal Swedish Acad. Engring. Scis. (adv. council 1980), Am. Nat., Argentine Nat., Bavarian, Polish, Royal Swedish, USSR acads. scis., Royal Acad. Exact, Phys. and Natural Scis. Spain (acad. fgn. corr.), Soc. Nuclear Medicine (hon.), World Assn. World Federalists (v.p. 1980), Fedn. Am. Scis. (bd. sponsors 1980-), Deutsche Akademie der Naturforscher Leopoldina (East Germany), Nat. Acad. Pub. Adminstrn., Internat. Platform Assn. (pres. 1981-86), Am. Hiking Soc. (bd. dirs. 1979-84, v.p. 1980, adv. com. 1984-), Royal Soc. of Edinburgh, Phi Beta Kappa, Sigma Xi, Pi Mu Epsilon, Alpha Chi Sigma (John R. Kuebler award 1978), Phi Lambda Upsilon (hon.) fgn. mem. Royal Soc. London, Chem. Soc. Japan, Serbian Acad. Sci. and Arts.

Sessoms, Allen Lee

OCCUPATION(S): academic administrator, former diplomat, physicist

EDUCATION: BS, Union Coll., Schenectady, 1968, PhD, Yale U., 1972

CAREER:

sci. assoc., CERN, Geneva, Switzerland, 1973-78, asst. prof. physics, Harvard U., Cambridge, Mass., 1974-81, sr. tech. advisor, OES, State Dept., Washington, 1980-82 dir., Office Nuclear Tech. & Safeguards, State Dept., Washington, 1982-87, counselor for sci. and tech., U.S. Embassy, Paris, 1987-89, polit. minister, counselor, U.S. Embassy, Mexico City, 1989-91, dep. chief of mission, U.S. Embassy, Mexico City, 1991-93, exec. v.p., v.p. for acad. affairs, U. Mass. Sys., Boston, 1993-95, pres., CUNY Queens Coll., Flushing, N.Y., 1995-

CAREER RELATED:

mem. adv. com. U.S. Sec. Energy; mem. NCAA Pres.'s Commn.

CREATIVE WORKS:

Contbr. articles to profl. journals.

CIVIC/MILITARY INFORMATION:

Adv. com. mem. U.S. Sec. of Energy.

AWARDS:

Ford Found. travel/study grantee, 1973-74; Alfred P. Sloan Found. fellow, 1977-81.

Shapiro, Jacob

OCCUPATION(S): physicist, educator

EDUCATION:

BS, Coll. City of N.Y., 1944, MS, Brown U., 1948, PhD, U. Rochester, 1954

CERTIFICATION: Diplomate Am. Bd. Health Physics.

CAREER:

physics instr., U. R.I., 1946-47, physicist, Atomic Energy Commn., N.Y.C., 1944-46, rsch assoc., U. Rochester (N.Y.), 1953-55, supr. radiation analysis, Gen. Dynamics Corp., Groton, Conn., 1955-60, lectr. in biophysics Sch. Pub. Health, radiation protection officer,

Harvard U., Boston, 1960-

CAREER RELATED:

lectr. in nuclear engrng. U. Conn., Groton, 1958-60.

CREATIVE WORKS:

Author: Radiation Protection, 1972, 2nd edit., 1981, 3rd edit., 1990; contbr. article to profl. jour.

CIVIC/MILITARY INFORMATION:

Cons. Concord (Mass.) Bd. Pub. Health, 1981-, Tech. Edn. Rsch. Ctr., Cambridge, Mass., 1988, sci. by mail Boston Mus. Sci., 1990-. With USN, 1944-46.

Wilson, Richard

OCCUPATION(S): physicist, educator

EDUCATION: B.A., Christ Church, Oxford U., 1946, M.A., D.Phil., Christ Church, Oxford U., 1949, M.A., Harvard U., 1957

CAREER:

Research lectr., Christ Ch., Oxford U., 1948-53, research officer Dept. Sci. and Indsl. Research, Christ Ch., Oxford U., 1953-55, research assoc., U. Rochester, 1950-51, research assoc., Stanford U., 1951-52, asst. prof., Harvard U., 1955-57, assoc. prof., Harvard U., 1957-61, prof., Harvard U., 1961- , Mallinkrodt prof. physics, Harvard U., 1983- , chmn. dept. physics, Harvard U., 1982-85, assoc. Adams House, Harvard U., 1971

CAREER RELATED:

served on numerous govt. adv. coms.

CREATIVE WORKS:

contbr. over 530 articles to sci. journals.

AWARDS:

Guggenheim fellow, 1961, 69; Fulbright fellow, 1959, 69, Fellow Am. Phys. Soc. (Forum award 1990)

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

Before the Nuclear Regulatory Commission

In the Matter of)	
)	
PRIVATE FUEL STORAGE L.L.C.)	Docket No. 72-22
)	
(Private Fuel Storage Facility)	ASLBP No. 97-732-02-ISFSI

CERTIFICATE OF SERVICE

I hereby certify that copies of the Notice of Appeal of Scientists for Secure Waste Storage and its brief in support of its appeal, both dated May 1, 1998, were served on the persons listed below (unless otherwise noted by e-mail with conforming copies by U.S. mail, first class, postage prepaid, this 1st day of May, 1998.

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e-mail: GPB@nrc.gov

Dr. Peter S. Lam
Administrative Judge
Atomic Safety and Licensing Board Panel
U.S. Nuclear Regulatory Commission
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U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001
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Atomic Safety and Licensing Board Panel
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

*Charles J. Haughney
Acting Director, Spent Fuel Project Office
Office of Nuclear Material Safety and
Safeguards
U.S. Nuclear Regulatory Commission
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Castle Rock, et. al.
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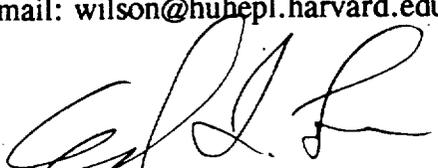
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Boulder, Colorado 80302
e-mail: landwater@lawfund.org

Danny Quintana, Esq.
Skull Valley Band of Goshute Indians
Danny Quintana & Associates, P.C.
50 West Broadway, Fourth Floor
Salt Lake City, Utah 84101
e-mail: quintana@xmission.com

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Washington, DC 20555-0001
Attention: Rulemakings and Adjudications
Staff
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copies for the commissioners)

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