Approved 3/6/87
Date

MINUTES OF THE SENATE COMMITTEE ON ENERGY & NATURAL RESOURCES.

The meeting was called to order by Senator Merrill Werts at
Chairperson

8:00 a.m./p.m. XXX on February 27, 1987 in room 123-S of the Capitol.

All members were present except:
Senator Eric Yost

Committee staff present:
Ramon Powers - Research
Don Hayward - Revisor
Nancy Jones - Secretary

Conferees appearing before the committee:
Prof. Larry Erickson, Manhattan,Ks., Chemical Engineer
Prof. Gale Simons, Manhattan, KS. Nuclear Engineer
Bill Henry, Kansas Engineering Society
Dr. Ralph Robinson, Kansas University Medical Center
Robert Clack, Manhattan, Ks.
Richard Meideinger, M.D. Radiologist, Topeka, Ks.
Craig Swartzendruber, Kansas Gas & Electric
Ray Peery, Executive Director, Central

SB 114 - Concerning low level radioactive waste

Larry Erickson believes Kansas should remain in the Compact for the following reasons: Unit cost for storage and processing will be lower if several states cooperate together; appropriate technology for designing, storage and immobilization is available in Kansas; employment opportunities will be enhanced; the safety record regarding transportation and shielding of workers is excellent. Opportunity for economic development with a low level waste disposal facility in Kansas is very possible. Mr. Erickson stated the possible expansion of the Compact to ten states could reduce unit storage costs and that the likelihood of high level radioactive waste storage in Kansas should not be a concern at this time. (Attachment A)

Gale Simons stated the most effective means for disposal of low level radioactive waste generated in Kansas is by membership in a compact. Safe and long term storage involving collection, transportation and packaging can best be achieved through the strength of states cooperating. The primary emphasis must be on the waste disposal site with a state-of-the-art facility such as underground vault storage. Safety research could be funded by a surcharge payable to the host state. The same provision could be applied after closure dependent upon charges and volume of waste stored during operation. A primary concern is that the best possible site be selected for the facility, based on geology of an area. (Attachment B)

Ralph Robinson, M.D., testified the availability of a storage facility is necessary for production of radioactive drugs as waste results from the manufacture of diagnostic agents. Perception by the public of the differences of high and low level radioactive waste has created a problem as materials being addressed are not hazardously radioactive, but must be properly managed. By withdrawing from the Compact, Kansas must still provide a licensed disposal facility to dispose of research materials from universities and Wolf Creek. By withdrawing, access to a proper site could be denied affecting medical research and aircraft companies in the state. (Attachment C)

Richard Meidinger supports maintaining the Compact agreement as it is vital to the health and welfare of citizens and to the medical and industrial economies. The Compact will provide long term management of waste and will prevent present and future controversies through cooperative efforts. Withdrawal will seriously limit physicians and medical facilities in providing diagnostic thest, treatment radiology and therapy to patients. It would also increase the cost of nuclear power to the consumer. Without the continued management and careful handling of low level waste that is being done, mismanagement and haphazard dumping could occur, jeopardizing all Kansans. (Attachment D)

Craig Swartzendruber testified that were Kansas to build its own disposal facility the cost of disposal would be five times greater than at a regional facility. Such an operation would add millions of dollars annually to disposal cost for generators and increase cost of electricity to users. Higher costs of Kansas doing it alone, will have a negative impact on hospitals, universities and existing industry in the state. Additionally, Kansas may appear less than receptive to possible new high technology by lack of participation. (Attachment E)

Bill Henry expressed the belief that Kansas would be better off economically and safer under the parameters of the Compact. (Attachment F)

Written testimony from Thomas Dobbs was given to Committee members. (Attach.G)

Questions and discussion by members concerned current disposal sites of waste generated at Wolf Creek (South Carolina and Washington), with transportation cost estimated at $40/cubic foot; storage accumulation on site for no longer than five years and the disposal plan for decommissioning of Wolf Creek. Advantages and disadvantages of subsurface or trench burial and an above ground facility were discussed. Mr. Henry stated the rules of the exclusionary process of site selection are still the most appropriate. Restrictions relating to proposals of contractors were explained by Mr. Peery. Discussion was held on the status of Oklahoma regarding waste disposal and possible future involvement of Kansas with waste from Oklahoma.

Dr. Robinson stated there would be a substantial increase in medical procedure costs with an increase in disposal costs. Concern was expressed that withdrawal would negate progress made since 1982 and shipment of necessary medical material would cease.

Robert Clack reviewed for the Committee his proposal for a low level demonstration site and recommendation for a mausoleum type facility with perpetual retrievability for protection of the air and ground water. Mr. Clack also explained the principles of the Super Conducting Collider and benefits it could bring to the state. (Attachment H)

Meeting adjourned. The next meeting will be March 3, 1987.

Senate Energy - Guest List

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John Woodman - KCPL	KC Mo	556-2155
Ralph G. Robinson MD	KU Med Ctr	KCKs 66103
RAY Peery	Central States Compact	
ROGER O LAMBSON	KUMC	
Ruth Schukman-Dakotas	KUMC	
Jerry Conrad	KG&E	
Craig Swartzendruber	KG&E, KCP&L, KEPCO	
Mary Ann Bradford	KS Adv. Comm. Environment	
James Power	KDHE	
Faye Campbell		Beloit, Ks.
Marlee Clark	KSPLC	
Kevin Mihm	—	TOPEKA
Shawn McGrath	Sierra Club	"
Ruth Wilkie	U.S.	"
Joe Harkins	KWO	TOPEKA
Mary Thompson	KDHE	TOPEKA
Harold L. Spiker	KDHE	Topeka
Bill Henry	KS Engineering Society	Topeka
Robin Somerhalder	Westinghouse	Hanston
Don Steeples	Kans. Geological Survey,	Lawrence
Larry Erickson	Kansas State Univ,	Manhattan
Cole Simons	Kansas State Univ.	Manhattan
Robert Eye	Nuclear Awareness Network	Lawrence, Ks.
Shri Stephens	NAN	Lawrence, KS
Richard Meidinger M.D.	Kan. Med. Society	Topeka
Inspeth Byer	KNRE	Topeka

TESTIMONY AGAINST SENATE BILL 114 AND HOUSE BILL 2175

Thank you for inviting me to testify. I am Larry Erickson, a chemical engineer employed by Kansas State University. The statements that I make are my own views. I am not here to represent the university or any other organization. I think Kansas should remain a member of the central interstate low-level radioactive waste compact for the following reasons:

(1) The scale of operation is important to the Kansas economy. The unit cost of low-level radioactive waste processing and storage should be much lower if several states cooperate together compared to Kansas trying to handle its own waste. The costs for roads, processing equipment, inspection, and administration will be almost independent of the volume of wastes processed and stored.

(2) Appropriate technology is available to store low-level radioactive wastes safely in Kansas. All wastes should be stored in solid form. Technology to immobilize liquid wastes in a solid matrix can be used to prevent leaching and groundwater contamination. The immobilization technology also reduces the escape of radioactivity. Furthermore, the wastes can be stored on a concrete floor or base. A cover or roof can be used to prevent water from coming in contact with the solid matrix. The design can be fully retrievable so that the stored material can be moved if necessary. This also allows for reprocessing if better technology becomes available. The best available technology should be used.

(3) The safety record associated with low-level radioactive substances is excellent. These substances are used in hospitals, medical clinics, dental clinics, universities, research laboratories, and many other places. They are shipped into Kansas without incident regularly. Many people work with low-level radioactive substances daily. The risk to the worker is not great because of the proper concern for safety on the part of those who work with these substances. Proper shielding is used to protect the worker. Those employed in the low-level radioactive waste industry are also not at great risk. The risks associated with farming, driving on the highway, and smoking are much greater in my opinion.

(4) Kansans are interested in economic development to enhance employment opportunities in Kansas. Being the host state for the storage of low-level radioactive substances is a good economic development opportunity. It can provide good employment for Kansans. Having facilities of this type in Kansas may also lead to other economic development opportunities for the state.

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TESTIMONY AGAINST SENATE BILL 114 AND HOUSE BILL 2175

Thank you for inviting me to testify. I am Gale Simons, a Professor of Nuclear Engineering at Kansas State University. The following statements are my own views. I am not here to represent the university or any other organization. I believe that Kansas should remain a member of the Central Interstate Low-Level Radiaoactive Waste Compact.

An economical and safe means for the disposal of low-level radioactive waste generated in Kansas must be established. This can most effectively be accomplished by belonging to a synergistic Compact.

The wastes stored at a low-level radioactive waste disposal site contain a wide variety of organic and inorganic compounds. These wastes are by-products from routine operations performed at hospitals, industries, and research laboratories. The work performed by the organizations that generate this low-level waste is important to the citizens of Kansas. We must retain and improve the basic research capabilities at our universities and medical centers, as well as provide modern health care at our hospitals. We must also provide support for existing, as well as new industries in the form of cost effective low-level waste disposal.

To assure the safe long-term storage of these wastes, it is important that appropriate collection, classification, packaging, transportation, and storage procedures be establihsed. This can best be achieved by using the strength gained by retaining membership in the Central Interstate Low-Level Radioactive Waste Compact.

Licensing requirements for land disposal of radioactive waste are specified by the Nuclear Regulatory Commission (NRC) in 10 CFR Part 61. To

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assure public safety, Section 61.41 requires that concentrations of radioactive material which may be released to the general environment in ground water, surface water, air, soil, plants, or animals must not result in an annual dose exceeding an equivalent of:

25 millirems to the whole body

75 millirems to the thyroid

25 millirems to any other organ

of any member of the public. In addition, the NRC also specifies that reasonable effort should be made to maintain releases of radioactivity in effluents to the general environment as low as reasonable achievable. These NRC requirements, on the maximum annual dose which the public is allowed to receive, are less than the nominal 100 millirems received each year from natural background radiation.

Selection of the waste disposal site is a very important decision. As specified in 10 CFR Part 61.50: The primary emphasis in disposal site suitability is given to isolation of wastes, a matter having long-term performance impacts, and to disposal site features that ensure that the long-term performance objectives are met as opposed to short-term convenience or benefits.

Safe long-term storage requires that the disposal site meet or exceed all of the performance regulations of 10 CFR Part 61. For example, during operation of the site, the regulations would require that the waste be in a dry, solidified, free-standing form and be in an approved package.

Only a state-of-the-art storage facility should be considered. This completely eliminates old shallow-land disposal procedures. An example of an improved procedure is underground vault storage of solidified waste. The waste

inside the vaults would be in a non-water soluable solid form. This would provide double protection against escape into the surrounding soil. Fill dirt and a water tight cover on each vault would also significantly reduce the dose rate at the surface of the ground and the material would be secure during severe storms. Adequate construction and operating funds must be available to satisfy this type of objective.

Provisions must be made to fund safety related research and independent monitoring of radionuclide releases during the life time of the site. This could be accomplished by assigning a surcharge, payable to the State in which the disposal site is located. This State would be responsible for awarding research contracts and funding other independent studies required to assure the continued efficient and safe operation of the disposal facility.

Provisions must be made for the safety of the site after closure. This could be accomplished by assigning a surcharge to every cubic meter of material accepted at the site, payable to the Compact, for perpetual care of the site after it is closed. This would include a fund for the long-term monitoring of radionuclide migration, security, and the maintenance of the site. The amount collected would be dependent upon the charges and the volume of waste stored during the operation of the site. Again, to keep the cost of low-level waste disposal affordable for the generator, it would be advantageous for Kansas to be a member of a Compact.

To assure that sufficient funding will be available, both in the near-term and the future, to provide the citizens of the state of Kansas with a cost-effective low-level waste depository, it is recommended that the state of Kansas remain a member of the Central Interstate Low-Level Radioactive Waste Compact.

Ralph G. Robinson M.D.
2216 West 49th Terrace
Shawnee Mission, Kansas 66205

February 26, 1987

Hon. Merrill Werts
Chairman, Senate Committee
on Energy and Natural Resources
State Capitol Building
Topeka, Kansas 66612

RE: SB 114, An Act Providing for the Withdrawal of Kansas from the Central Interstate Low-Level Radioactive Waste Compact

Dear Senator Werts:

I enclose a statement in opposition to SB 114, which I ask be placed in the record of the Senate Committee on Energy and Natural Resources at its meeting Friday morning, February 27, 1987.

If I can be of any service to the committee regarding the subject matter of SB 114, please do not hesitate to contact me at 913-588-6810 (office) or 913-262-4741 (home).

I hope that the information enclosed is of benefit in your deliberations.

Sincerely,

Ralph G. Robinson, M.D.

RGR/p

Encl.

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STATEMENT REGARDING KANSAS SENATE BILL 114, AN ACT PROVIDING FOR THE WITHDRAWAL OF KANSAS FROM THE CENTRAL INTERSTATE LOW-LEVEL RADIOACTIVE WASTE COMPACT

PRESENTED FOR THE RECORD OF THE SENATE COMMITTEE ON ENERGY AND NATURAL RESOURCES MEETING, FRIDAY, FEBRUARY 27, 1987.

STATEMENT PRESENTED BY RALPH G. ROBINSON, M.D.

February 27, 1987

STATEMENT

Mr. Chairman, members of the Committee on Energy and Natural Resources. I am Ralph G. Robinson, M.D., a practicing Nuclear Medicine physician at the University of Kansas Medical Center. I am opposed to the passage of Senate Bill 114, which provides for the withdrawal of Kansas from the Central Interstate Low-Level Radioactive Waste Compact, and wish to place this information in the record of the Committee.

I wish to make it clear that I appear before this Committee as an individual. I speak from considerable experience in the field of Nuclear Medicine and low-level radioactive waste. I have been Head of the Division of Nuclear Medicine at the University of Kansas Medical Center since 1969. I have been involved with nuclear medicine, nuclear reactors and high- and low-level radioactive materials and radioactive waste since 1963. I have been a member or consultant to the Food and Drug Administration's Advisory Committee on Radioactive Drugs for the past 13 years, and have served as a consultant to the Isotopes and Nuclear Chemistry Division of Los Alamos National Laboratories for the past 6 years. I have served as President of the American College of Nuclear Physicians. I am also one of two public members on the Kansas Advisory Board on Low-Level Radioactive Waste.

I would first like to make a few comments regarding the need for access to properly licensed and operated low-level radioactive waste sites, and later make some specific observations regarding the potential adverse effect that passage of SB 114 would have on the practice of medicine, medical research and industry in the State of Kansas.

Nuclear Medicine is that practice of medicine which uses radioactive materials for the diagnosis and treatment of disease. As a Nuclear Medicine practitioner I am primarily concerned with the administration of small quantities of radioactive materials to patients for diagnostic purposes, as the physiologic amounts of radioactive chemical we use allows us to study function by methods not duplicated in medicine. Studies of heart and kidney function, and studies of the skeleton with

radioactive phosphates to detect very early spread of metastatic cancer are a few of the common procedures usually performed. Without the availability of low-level waste disposal sites, a medically necessary radioactive drug cannot be produced. Most diagnostic radioactive drugs given to patients have very short physical lifetimes and long-term waste disposal is not a problem. However, the manufacture of these clinical diagnostic agents does result in small quantities of low-level radioactive waste that must be disposed of by the manufacturer.

On a broader scale, I am concerned about the impact of the lack of access to proper low-level radioactive waste disposal sites on medicine in general. Virtually all classic pharmaceutical drug development requires the use of radioactive labels to study the metabolism and distribution of these new therapies in animals and in patients, to find out how the compound is metabolised. A radioactive tracer is generally the only way to study these promising new drugs. Thus, the lack of access to proper disposal sites in the United States could virtually halt well over 95% of all new drug development, now and in the future. In addition, we estimate that 30-40% of all cancer research uses radioactive labels. As we will see in a moment, it is usually the research radioactive compounds that are the ones that must be properly disposed of. The ones important in biomedical research, for example the radioisotopes tritium (H-3) and carbon (C-11), the building blocks of most compounds of the body, have long physical lifetimes and must be stored for dozens or even hundreds of years, even though their radioactive amounts are very small. The concern of medicine over the continued availability of these powerful research tracer compounds is such that the American College of Physicians (which represents the broad field of Internal Medicine and all of its medical subspecialties) the AAMC (American Association of Medical Colleges - which represents all medical schools in the United States), and the American Medical Association are all on record in support of the medical necessity of continuing the development of additional low-level radioactive waste disposal sites in the United States.

If radioactive materials used in medicine are so important, why do we have a problem at all? One reason is that the public at large often fails to perceive the differences between high- and low-level radioactive waste materials. Low-level waste consists of materials in small radioactive amounts, which come from activities not associated with reactor fuel processing or storage, nuclear weapons

production or dismanteling, or the mining of uranium. Thus, we are talking about extremely small quantities of radioactivity when we are discussing low-level radioactive waste. The problem with low-level radioactive waste is one of volume - cubic meters of material, paperware, glassware, clothing, tools and other clinical and research products must be properly disposed of. The biggest volume producer is the routine maintenance activities normally occurring in commercial nuclear power reactors, whereby clothing, tools, resins and other products which are or potentially may be contaminated by radioactive materials must be treated as low-level radioactive waste. This material has nothing to do with the nuclear reactor fuel cycle. The materials which we are addressing today are not hazardously radioactive. They are admittedly somewhat radioactive, and by law, must be properly managed.

What does this mean to Kansas? The Congress of the United States, in reaction to the need for low-level radioactive waste facilities, created in the Low-Level Radioactive Waste Policy Act of 1980 a mechanism whereby states could band together on a regional basis and in a relatively economical, geographic effort, adopt a reasonable plan to dispose of the low-level radioactive waste within their region. In response to that act, Senator Dole and Representative Glickman introduced the enabling legislation to establish the Central Interstate Low-Level Radioactive Compact. This compact received congressional approval in the Low-Level Radioactive Waste Amendments Act of 1985. A Central Interstate Compact Commission was subsequently established and has gone about its mandated business of an orderly evaluation of possible disposal sites within the borders of the 5 states comprising the Central Compact. Congress has given the states an opportunity to demonstrate a prototype method of handling one sort of waste on a regional basis. The 1985 congressional legislation also provides severe penalities on the generators of radioactive waste and upon the states that do not meet certain milestones spelled out in the Act.

Of greatest importance to us today is the fact that each state is held responsible for the radioactive waste generated within its borders. If Kansas is to withdraw from the established Central Compact Commission, it will still have to provide a licensed disposal facility within its own borders. We will still have the problem of disposing of the research materials from our colleges and universities and from the operating commercial nuclear reactor within our state. Because of the expense of

obtaining a proper license from the Nuclear Regulatory Commission, the indemnification and perpetuity requirements to provide for the continuing supervision of such a licensed disposal facility and the construction requirements, it has been estimated that there is a minimum $25 million start-up cost before any waste is received. That cost is up front, no matter how large or small the ultimate volume you project will need to be stored in that facility. If the volume coming to the site is small, the economics of operating that site come into play and the cost per unit volume of waste disposed of may rise so high as to make it prohibitive for a medical waste generator to continue with those clinical and research activities. We are currently paying $25 per cubic foot. We project a cost of $50 per cubic foot in 1993 if the compacts are established as planned. If Kansas were to "go it alone", the volume of waste we produce within our border would require a fee of $500 a cubic foor for the site to break even.

There are over 1,200 test tube and animal research projects currently active which require the use of radioactive research compounds at the University of Kansas Medical Center. There are also several dozen clinical research protocols calling for the use of radioactive agents. We have over $12 million in active research grants at the Medical Center. I do not have exact figures, but a conservatiave estimate is that at least half of these grants involve research projects which require the use of research radioactive compounds and chemicals. We also perform over 10,000 routine diagnostic and clinical procedures per year at the Medical Center's hospital which involve the administration of a radioactive diagnostic drug to a patient. Another 30-40,000 assay procedures on blood and urine samples are performed which require the use of a radioactively labeled compound in the test tube. All of these activities, as well as similar activities at colleges and universities throughout the state, and at the over 100 hospitals in the State of Kansas licensed to utilize radioactive materials would be jeoparadized, if not completely shut down, by the lack of access to a proper radioactive disposal site. The two large radioactive disposal sites currently available on a national basis will close by 1993, as provided for in the Low-Level Radioactive Waste Policy Amendment of 1985.

In addition, those companies in the Wichita area which provide luminescent (radioactively painted) dials and gauges for the aircraft industry could be severely compromised. Also, the use of industrial radiographic sources to inspect the

critically important welds of aircraft and other materials of strategically critical strength also occasionally result in the production of low-level radioactive materials which require disposal.

Should Kansas be chosen by the contractor for the Central Compact Commission as the best site within the 5 states of that compact, the establishment of a proper disposal site would provide economic incentives to the region so selected. In addition to ordinary shallow land burial, which has been utilized successfully in South Carolina and in the State of Washington these past 20-30 years for the disposal of most the nation's low-level radioactive waste, there are now at least 5 other technologies which have varying appeal to replace shallow land burial, as they provide even greater safety toward the accidental loss of any of the stored materials into the environment. Thus, several attractive alternative technologies now exist for the disposal of low-level radioactive waste with an even greater margin of safety.

I believe that to remove ourselves from the Central Interstate Compact would not be in the best interests of Kansas. To do so would leave us with the problem of caring for the radioactive waste generated within our own borders, at a much higher and perhaps prohibitive unit cost, while at the same time burning our bridge from access to other disposal sites. The safe disposal of low-level radioactive waste is a technologically manageable problem.

It would be unwise to burn any bridges. This bridge would be extremely difficult to rebuild.

If I can provide any additional information or service to this Committee relative to the considerations raised by Senate Bill 114, please do not hesitate to contact me at 913-588-6810 (office) or 913-262-4741 (home).

JOHN W. TRAVIS, M.D.
PHILLIP B. S[illegible] M.D.
MILLARD C[illegible]JCER, M.D.
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February 26, 1987

MEMO

RE: Low Level Radiation Compact

Dear Sirs:

I wish to speak in support of maintaining Kansas in the low level radiation depository compact because I believe strongly that it is in the vital long term interests of the state for both our industrial development and even more importantly for the health and welfare of the citizens of the state. Without a low level deposit site, radiation waste which we generate in our hospitals and research facilities would basically be terminated and we would no longer have the ability to process these now vital and important items. I believe you will hear testimony supporting the necessity of realistically handling radioactive wastes which are of little environmental consequence, if handled appropriately. They won't go away. I believe any emotional issue such as this should be looked at in a very careful and measured way before a reaction to rescind our carefully studied and developed plan is destroyed.

Richard Meidinger, President
Radiology and Nuclear Medicine,
a Professional Association

Consultant to the Department
of Health and Environment,
Radiation Control Section

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In November, 1979, the use of Radioisotope in medicine and medical research, industrial development, and atomic power for peaceful purposes almost came to a halt because the only burial sites for these wastes were closed. The governors of these states did so because of the limited capacity and indicated that each state or region should be responsible for its own waste. As a result of this real and perceived crises, Congress enacted legislation that makes low-level waste the responsibility of each state within their own borders, or enter into regional compacts with surrounding states to develop such disposal sites.

Approximately 25% of this "low level radioactive" waste comes from hospitals and medical research, and an additional 25% comes from industry - for such things as oil drilling, instrument calibration, and research and development of the aircraft and energy industries. This does not include the waste products of Wolfe Creek!

The purpose of the interstate compact recognizes the proper employment of scientific and technological discoveries in nuclear and related fields, and their applications in the general effect on the health, economic development and industrial progress of our region. It also recognizes the optimum benefit from nuclear and related scientific resources, facilities and skills requires systematic guidance, assistance and cooperation. The regional concept has definite economic and political benefits in terms of safe handling, transport, treatment, and storage or disposal of the low-level waste to provide long-term management of waste to protect the population and

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environment and to assist in the orderly economic development of the party states. It is also constructed to prevent present and future controversies and form an instrument for cooperative efforts relating to its disposal.

By withdrawing from the compact, you seriously limit the ability of physicians and hospitals to provide many of the services, diagnostic tests in the clinical laboratory, radiology and nuclear medicine, and therapy to our patients. It also seriously inhibits or actually stops much of the basic medical and industrial research in the state, as well as seriously curtailing such basic industries as aircraft, oil, non-nuclear power generating plants, and more. It, of course, seriously affects the Wolfe Creek plant and will significantly increase the cost of electric power.

Just what are we afraid of? There is no evidence of any injury, present or future, which has been directly and/or scientifically tied to low-level waste disposal. For example, it is estimated that the one curie of naturally occurring Carbon-14 radioactivity is used in the nations hospitals, research facilities, and industry. This amount of radiation is insignificant compared to the 20 curies of C14 actually accumulated in New York City's garbage in the same time. This is less than the 230 million curies of C14 now in the world as a result of cosmic radiation from cosmic rays of the sum and stars! These trivial amounts of radioactivity represent no conceivable hazards. The direct cost of packing and transportation to cross-country storage is greater than 16 million per year, and carbon 14 is best stored in paper or plastic containers to attenuate its weak Beta radiation.

The term "low-level radioactive waste" means waste containing radioactive nuclides emitting primarily Beta and/or Gamma radiation, which is NOT spent fuel or high level waste and containing less than 10 manacuries per gram of only transuranic elements or as otherwise defined. This consists of:

1. General trash of contaminated paper, plastic, rubber, and filters used in ventilation and gas treatment systems, metal and glass containers, protective clothing, insulation material.
2. Discarded contaminated equipment used in the manufacture or use of radioactive materials.
3. Wet wastes from reactor operations, lab wastes, filtering aids and sludges.
4. Organic liquids and solutions used in medical and academic research institutions.

Most have short half-times, some very long, but the most toxic part is often the non-radioactive chemical or solvent containing the radiation which is itself chemically toxic!

In summary, the unscientific, unfounded and apparent emotional disregard for the Compact, which has been painstakingly developed over the past 6 years, leaves Kansas and Kansans in extreme jeopardy! Without orderly and carefully regulated handling and storage of this toxic waste, we are opening ourselves to illegal and haphazard dumping of toxic waste and severe restriction on medical care, research and current and future economic development!

I am sure that you will exercise your learned position, separate emotion from reality and defeat this bill - for a prosperous and healthy Kansas!

THANK YOU

R. Meidinger, M.D.

TESTIMONY CONCERNING SENATE BILL NO. 114

My name is Craig Swartzendruber and I am testifying on behalf of Kansas Gas and Electric Company, Kansas City Power and Light Company and Kansas Electric Power Cooperative Inc, owners of Wolf Creek Generating Station.

We believe it is not in the state's best interests to withdraw from the Central Interstate Low-Level Radioactive Waste Compact because of the extra costs it would impose upon Kansas. Kansas should stay in the Compact and support the approach taken by the State over the last two years of working in cooperation with our neighboring states to address the issue of low-level radioactive waste disposal on a regional basis.

From an economic view point, staying in the Compact and having a regional disposal facility is clearly the best decision on this issue. If Kansas were to build its own disposal facility for use only by Kansas waste generators, the cost of waste disposal is estimated to be five times greater than at a regional facility.

Dames and Moore, as part of a Draft Management Plan Assessment of Alternative Treatment and Disposal Technologies, has developed cost estimates for a Central Interstate Compact Regional Site for the Compact Commission. The Dames and Moore cost estimates for a Regional facility of 150,000 cubic feet per year were derived from a detailed cost analysis for a 10^6 cubic feet per year disposal facility. The regional waste generators and potential site developers feel that 80,000 cubic feet per year is a more

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accurate estimate of projected regional waste volumes. We have internally used the Dames and Moore cost estimating methods to project the costs for a 80,000 cubic feet per year Compact Site and a 15,000 cubic feet per year Kansas alone facility.

Fixed annual costs for a disposal facility are estimated to range from 17 to 20 million dollars. Most of the annual costs associated with a disposal facility are these fixed costs and they do not go down as volume decreases. Thus the amount of waste available for disposal directly affects the cost per cubic foot needed to pay for a facility on an annual basis. Waste generators currently pay approximately forty dollars per cubic foot at the existing burial sites. The cost could vary from an estimated $220 per cubic foot, for a 80,000 cubic feet per year regional site to $1175 per cubic foot, for a 15,000 cubic feet per year Kansas alone facility.

Operating a facility which only accepts waste from within Kansas would add millions of dollars annually to the disposal costs of the generators. The annual cost for WCGS to dispose of 10,000 cubic feet per year could range from an estimated $2.2 million at a regional site, to as much as 13.7 million at a Kansas alone facility which represents a penalty of more than $11 million a year. As stated earlier, the Kansas alone facility could be five times more expensive to utilize. This would increase the cost of electricity to most users and could add tens of thousands of dollars to the bills of the larger electricity users in the affected service areas on an annual basis.

The higher costs associated with a Kansas alone disposal site would have a negative impact on hospitals, universities and existing industry in the State. Unfortunately these added costs do not appear to buy any significant benefits in terms of enhanced safety or lessened risk.

Additionally, by not participating constructively and cooperatively with neighboring states on this issue, is the state not sending a message to potential new employers (such as the Super conducting Super collider project) that Kansas is less than receptive in its dealing with high technology areas?

The organizations I represent are eager to work with appropriate State government representatives in any way to ensure safe, and to the extent practicable, economic waste disposal. Based on our understanding of this issue the present Compact appears to be able to best achieve these goals.

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Kansas Engineering Society
Testimony on S.B. 114
February 27, 1987

Kansas Engineering Society believes that there are two practical options that Kansas should consider at this time in relation to the disposal of low-level radioactive waste.

1. Remain in the Central Interstate Low-level Radioactive Waste Compact or
2. Adopt legislation removing Kansas from the compact.

Opting out of the compact would result in payment of damages to the compact and Kansas having a low-level radioactive waste disposal site with a significant higher unit disposal cost. The question of being able to exclude waste that originates in other states is unresolved at this time.

Even if we assume that remaining in the compact would result in a low-level radioactive waste disposal site in Kansas we believe that Kansas should remain in the compact. A site operated under the compact should provide a more reasonable cost and the assured support and participation of the four other states in the compact.

The Kansas Engineering Society supported the compact in 1982 and continues to support it in 1987.

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Thank you for the opportunity to put my statement on the record. My name is Thomas K. Dobbs and I am the Technical Operations Manager at Chemsyn Science Laboratories of Lenexa, Kansas. My main statement concerns the Senate Bill SB114, which proposes to remove the state of Kansas from the Compact.

The low level radioactive waste problem is a real one, but the Compact helps rather than hinders this problem for the State of Kansas. Further, the benefits which are brought about by the use and handling of radioactive materials can be seen in the medical, scientific, and technological communities.

My company, Chemsyn Science Laboratories, uses low-level radioactive materials on a daily basis. Our synthesis of tritiated and carbon-14 labeled products is our life blood, so to speak. We do not make these compounds for trivial purposes. The radioactive products we produce are needed for cancer research studies, environmental pollutant studies, toxicology studies, and a variety of other medically-related studies. If these compounds were not available, the advances which have been made in these various areas of research would certainly have come about at a much slower pace.

I would like to elaborate on this point. Many cancer studies are performed to determine if a substance will cause cancer in an animal subject. In order to detect a tumor through purely physical means (such as palpation or visual detection) the dose of carcinogenic substance must be increased to well outside the limits of normal human consumption. This is why you may have heard that a person would have to drink the equivalent of 800 bottles of diet soda a day before any cancer would occur do to the saccharin. This was the equivalent of what the lab animals were receiving. In many cases a suspect carcinogen will cause toxic affects before any carcinogenic affects can be detected. It is obvious that no positive cancer data can be obtained from such a test. Furthermore, when unrealistically high does levels of a compound are used in order to elicit a carcinogenic response, as is often the case when unlabeled compounds are used in cancer

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studies, a potentially useful compound may be falsely labeled as a carcinogen. Withdrawal of such compounds from general public use substantially lower our quality of life.

When a researcher is able to use a radioactive test substance, the same dose equivalents that would occur in the human population can be administered to the test animal, even if such doses are on a minute scale. The reason that this can be done is that the level of detection is greatly enhanced whenever a radiolabeled compound is used. Results can be quantitative and can be directly correlated with human circumstances. Since any change in genetic structure can easily be detected with a radiolabeled carcinogen (known as the marker), test results for suspect carcinogens can be obtained much more quickly than in any epidemiologic study. No one can deny the usefulness of such information, and the more rapidly such information can be relayed to the public, the better off we will all be. But such benefits can only be obtained through the careful use of radiolabeled substances.

Although I have concentrated on the field of cancer research, many of our radiolabeled compounds are used in similarly beneficial ways by other members of the research community. Radiolabeled analogs of environmental contaminants are used to study the environmental effects of such substances. Such data is necessary in order to logically formulate environmental regulations. And yet, the final results of these studies would be long in coming if the researchers had not had the right tools at their disposal, namely the radiolabeled contaminants with which to do their studies.

We have supplied many radiolabeled products to pharmaceutical companies who need to perform FDA studies before distributing their products. The benefits which have been made available by various pharmaceutical products, such as pain killers, antibiotics, and medicines for the treatment of disease have unquestionably enhanced our quality of life. And this can be partially attributed to the

types of products we have been able to supply to pharmaceutical companies to aid them in their drug testing.

Without the use of radiolabeled compounds, then, major areas of medical, environmental, and pharmaceutical research would have to be altered. The progress which has been made in each of these fields due to the availability of radiolabeled compounds cannot be estimated in any dollar amount.

Radiolabeled compounds are indispensible tools which we are committed to providing for the research community. The proposal to remove the state of Kansas from the compact would greatly hinder our ability, and others in the research community, to serve the scientific community. The direct economic effect on the state of Kansas should this proposal be approved are the immediate loss of jobs, tax supports, and loss of technological advancement.

States have been allowed to form Interstate Compacts for establishing and operating regional disposal facilities for low-level radioactive waste. Kansas, Louisiana, Nebraska, Oklahoma, and Arkansas have entered into the Central Interstate Low-Level Radioactive Waste Compact. This compact states that each party State shall have the right to have the waste generated within its borders managed at a regional facility within the five-State Compact Region. If Kansas were to withdraw from the Compact, the state of Kansas would no longer be in compliance with the federal Low-Level Radioactive Waste Policy Act, which requires each State to have ratified its participation in a regional compact or to have indicated its intent to develop a site for the location of a low-level radioactive waste disposal facility within such a State. Well, then, where is our low-level radioactive waste going to go?

The withdrawal from the compact does not guarantee Kansas will never have a low-level radioactive waste disposal facilities within the State. On the contrary, it increases the probability that we will have such a site in the state of Kansas. Are we prepared to dispose of low-level radioactive waste in Wyan-

dotte County, in Platt County, in Cowley County? I can assure you that such actions should already be in place before we can even think of leaving the Compact. For if they are not in place, the result is that any low-level radioactive waste generated within the State may be denied access to the existing regional disposal facilities.

This would create problems for private companies as well as all hospitals and universities in the state of Kansas. Some facilities may have to curtail or discontinue their operations. As I stated previously, if a facility such as ours were to discontinue the types of services we offer to the research community, the consequences would inadvertently be felt by all members of the general population.

Further, if we were to build a disposal facility in Kansas to be used only by Kansas waste generators, which is definitely what we would have to do if we withdraw from the Compact, the cost of waste disposal would be higher than at a regional facility. Operating a facility which only accepts waste from Kansas generators would add millions of dollars annually to disposal costs to the generators.

The cost of building the disposal site is another matter to consider. This type of additional spending which would be required of the state of Kansas can be keenly felt by each of us taxpayers as April 15 draws near.

Even if Kansas withdraws from the Compact and builds its own disposal facility, this does not guarantee that we would be able to prevent nuclear waste being generated outside Kansas from being disposed of here. The Interstate Commerce Clause of the United State Constitution prohibits states and localities from establishing protectionist measures that "discriminate against articles of commerce coming from outside the State unless there is some reason, part from their origin, to treat them differently." The Supreme Court has upheld this clause in a New Jersey ruling. Therefore, the benefits, if they can be viewed as such, of

leaving the compact so as to only be responsible for in-state waste, would not even be applicable, according to the U.S. Constitution.

As a member of the Compact, we are only one of five states that may be asked to host a regional burial facility. As a non-member we will definitely host a burial facility, which must accept all in-state waste and possibly out-of-state waste as well.

I therefore urge you not to accept SB 114. We should continue to support the wise approach that Kansas has taken over the past two years; that is, working in cooperation with our neighboring states to address the disposal of low level radioactive waste. The communities of private industry, education, and medicine are willing and eager to work with appropriate state government representatives to ensure safe, practical, and economic waste disposal. I strongly feel that remaining in the Compact best addresses these goals.

February 27, 1987

MY NAME IS ROBERT W. CLACK. I AM A RESIDENT OF RILEY COUNTY, ABOUT THREE MILES WEST OF MANHATTAN. I AM RETIRED FROM THE DEPARTMENT OF NUCLEAR ENGINEERING AT KANSAS STATE UNIVERSITY. I AM CERTIFICATED BY THE AMERICAN BOARD OF HEALTH PHYSICS, A PROFESSIONAL STANDARDS BOARD IN THE FIELD OF RADIATION PROTECTION. I AM SUPPORTIVE OF THE NUCLEAR POWER INDUSTRY FOR THE FOLLOWING REASONS:

1. Nuclear fuel is a source of electric energy which is not under the control of the Organization of Petroleum Exporting Countries.

2. Nuclear fuel consumption does not contribute to the acid rain problem.

3. Nuclear fuel does not contribute to the carbon dioxide "green-house" problem.

I SUPPORT NUCLEAR MEDICINE BECAUSE OF THE MAJOR CONTRIBUTIONS IT HAS MADE TO OUR HEALTH AND LONGEVITY. IF WE ARE TO HAVE THE BENEFITS OF NUCLEAR POWER AND NUCLEAR MEDICINE WE MUST BE PREPARED TO MANAGE THE NUCLEAR WASTES. I AM CONVINCED THAT NUCLEAR WASTES CAN BE MANAGED IN A SAFE, ECONOMIC AND POLITICALLY ACCEPTABLE WAY--A WAY THAT DOES NOT INCLUDE LAND BURIAL.

I am here, by invitation, to answer such questions as members of this committee may wish to address to me within my field of expertise or matters on which I have been quoted in the press in recent days.

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