

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of }
UNION ELECTRIC COMPANY }
(Callaway Plant, Unit 1) }
 }
 Docket No. STN 50-483 (OL)

NRC STAFF TESTIMONY OF
MARLEE CARROLL ON REED CONTENTIONS 6 AND 16

Q.1. Please state your name and position with FEMA with respect to the Callaway Plant.

A.1. Marlee Carroll, Community Planner, Technological Hazards Branch, Natural and Technological Hazards Division, FEMA - Region VII.

I serve as the FEMA Regional Assistance Committee (RAC) member responsible for reviewing the State and local plans and determining whether or not they are in compliance with the guidance established in NUREG-0654, FEMA REP-1, Rev. 1, "Criteria for Preparation and Evaluation of Technological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants". FEMA and other RAC members have been assigned various elements of the guidance to review. Most of the elements have a review overlap where two or more RAC members are assigned to evaluate the criterion. FEMA consolidates all of the comments, rectifies conflicts and prepares a RAC review identifying deficiencies which require corrections. The state and local plans should be corrected accordingly.

FEMA and the other RAC members also monitor and evaluate state and local off-site response during annual exercises of the plant and the planning efforts. These exercises test the ability to respond adequately to a potential problem as well as the players' adherence to the plan.

A statement of professional experience and education is attached.

Q.2. Please state the purpose of this testimony.

A.2. The purpose of this testimony is to address the John Reed contention numbers six and sixteen, attached.

Q.3. Mr. Reed contends Potassium Iodide (KI) should be distributed to members of the general public within the 10-mile emergency planning zone. Please describe FEMA's views as to distribution of KI to the general public.

A.3. It has been FEMA's position that the decision as to whether or not KI should be used by the general public during a radiological emergency would be left to the state.

A FEMA "Interim Policy Guidance on Potassium Iodide", December 1, 1982, has attempted to clarify some of the questions about KI as outlined in NUREG-0654/FEMA-REP-1, Rev. 1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," elements J.10.e. and J.10.f. by stating:

Each State has a responsibility for formulating guidance to define if and when potassium iodide is used as a thyroid blocking agent for emergency workers, institutionalized persons, and the general public. Where States elect not to include KI in their preparedness posture either for emergency workers or institutionalized persons, the plans should state under whose authority the decision was made and the rationale for the decision. This rationale should include a description of the alternatives to the use of KI to which the State is committed in the preparedness supporting the State and local plans. This may include special ventilation, sealing of structures, or the use of expedient respiratory protection such as dustmasks.

Emergency workers and institutionalized persons are considered on a different level than the general public. They might have to remain in the plume exposure pathway zone after the general public has been evacuated and should, therefore, have KI readily available. Procedures for distribution and administration should be established.

Though FEMA continues to support the use of KI for this purpose, our National Office is reviewing the guidance in planning standard "J" to determine whether the demonstration of an appropriate alternative for institutionalized persons could be acceptable.

The FEMA position on the distribution of KI to the general public is that this matter is within the discretion of state health officials. This position is amplified in the response to Question 4 below.

Q.4. Is the FEMA position on KI consistent with that of other Federal Agencies?

A.4. The Federal Radiological Preparedness Coordinating Committee (FRPCC), consisting of Federal Emergency Management Agency (FEMA), Nuclear Regulatory Commission (NRC), Environmental Protection Agency

(EPA), Department of Health and Human Services [(HHS) including both Food and Drug Administration (FDA) and Public Health Service (PHS)], Department of Energy (DOE), Department of Transportation (DOT) Department of Defense (DOD), U.S. Department of Agriculture (USDA), Department of Commerce (DOC) and where appropriate and on an ad hoc basis, other Federal departments and agencies, details in its "Federal Policy of Distribution of Potassium Iodide around Nuclear Power Sites for use as a Thyroid Blocking Agent," October 2, 1982:

Recent Food and Drug Administration guidance (June 29, 1982) states that risks from the short term use of relatively low doses of KI for thyroidal blocking in a radiation emergency are outweighed by the risks of radioiodine induced thyroid nodules or cancer at a projected dose to the thyroid gland of 25 rem.

The FRPCC further explains the NRC/FEMA reasoning behind the guidance in NUREG-0654/FEMA-REP-1, Rev. 1, recommending the stockpiling and distribution of KI to emergency workers and to institutionalized individuals.

- (1) the number of individuals for any site is small and requires a limited supply of KI that can be readily distributed;
- (2) these individuals would be more likely to be exposed to a radioactive plume in the event of an accident;
- (3) the medical histories of the limited number of such individuals can be reviewed and the distribution and administration of KI readily controlled; and
- (4) these individuals can be readily monitored for adverse effects by medical personnel.

This guidance on the distribution and use of KI for all commercial nuclear power plant sites is hereby Federally endorsed as available protective action for this limited number of individuals in the event of a catastrophic nuclear power plant accident.

It is recognized that the decision to use KI for thyroid blocking to protect the health and safety resides with the State and local health authorities. Therefore, with the exception of the NRC licensee's personnel located on-site during the accident, the decision for use of KI during an actual emergency by all other individuals for whom the use of KI is recommended are the responsibility of these authorities. In addition, because the factors bearing on the desirability of stockpiling and distributing KI for thyroidal blocking of the general population within the Emergency Planning Zone for the Plume Exposure Pathway depend heavily on local conditions, this matter is a decision for State and local authorities to make. In deciding whether to distribute and use KI for the general population, these authorities should carefully evaluate advantages and possible problems in implementing this program for the specific nuclear power plant(s) within their jurisdiction.

One of the considerations in deciding whether to implement the use and distribution of KI for the general population is that KI blocking only effectively reduces the radiation exposure of the thyroid gland. While this is an important contribution to the health and safety of the individual, it is not nearly as effective as measures which protect the total body of the individual from radioactivity. Both in-place sheltering and precautionary evacuations can reduce the exposure to the total body. . . . The use of KI for thyroidal blocking is not an effective means by itself for protecting individuals from an airborne release of radioactivity from a nuclear power plant accident and, therefore should be used in conjunction with sheltering, evacuation, or other protective methods.

The Chairman of the FRPCC, who is a FEMA official, has requested a departmental and agency concurrence in this FRPCC Policy Statement.

Q.5. If the State of Missouri does not give out KI to the general public, does FEMA require that it take any compensating measures? Why/why not?

A.5. At the present time, FEMA's posture on the recommended use of KI is directed toward emergency workers and institutionalized persons who are not likely to be evacuated, or whose evacuation might be delayed. If the State chooses not to distribute KI to the general public, no special compensating measures are required. The emphasis for protection of the general public is that they be educated to tune

to their local Emergency Broadcasting Station (EBS) and follow any instructions concerning shelter, protective actions, and if necessary, evacuation.

Q.6. What is the State of Missouri's position with respect to the distribution of KI to the general public? Is this acceptable to FEMA?

A.6. The Division of Health, Bureau of Radiological Health (BRH), will provide KI for use by State and local emergency workers who may be exposed to a projected dose to the thyroid of 25 rem or greater. They have decided that evacuation is a more feasible logistical response for the protection of the general public than distribution of KI. At the present time, the choice of evacuation for the general public, in lieu of distribution of KI, is acceptable to FEMA.

"Missouri Nuclear Accident Plan, Callaway" May, 1983, p. B16, item H.6 states that KI "will be provided for persons for whom evacuation would not be feasible by State and local emergency personnel under BRH direction as conditions warrant, based on the criteria specified above." This is not totally acceptable to FEMA. Item H.6 is unclear as to whether these persons for whom evacuation would not be feasible are institutionalized persons, transportation dependent people or the general public instructed to remain in long term shelter. Without more specificity, there would be no way to adequately stockpile and plan for distribution of the KI.

Q.7. Mr. Reed also questions the messages provided to the public regarding long-term sheltering. Could you please briefly describe the instructions for long-term sheltering?

A.7. "The Missouri Nuclear Accident Plan, Callaway", May, 1983, addresses several concerns in the "In-house shelter message #5," p. C.10. Missouri properly identifies the area of concern by boundary lines or by landmarks rather than Map Sectors which would require the public to reference their emergency brochure to determine if they were in an affected area. The plan considers people outside, working or traveling, as well as those indoors. The message acknowledges that these instructions are currently intended only for those people residing in the designated areas. Other State plan EBS messages have been more specific in this area. For example, the Nebraska "Radiological Emergency Response Plan for Nuclear Power Plant Incidents, April, 1983, p. G-29 Message 5, also informs the public to:

- . . . 2. If you have come in from outside, wash your hands and face as a minimum, particularly before handling or eating any food. If possible, take a shower using cool or luke warm water. Wash any items of clothing you were wearing while outside.
- 3. Cover all "open" food containers.
- 4. Do not use your telephone unless it is absolutely necessary. Keep phone lines open for emergencies.
- 5. Stay in house until you receive official notice that it is safe to go out. Stay tuned to your Emergency Broadcasting Station for later information and further instructions.

This message is repeated.

Their following announcement #7, p. G-31 advises that people not go out without using respiratory protective devices to protect against the airborne particles of radioactive particulates, but:

If you must venture outside, be sure to use such a device.

Improvised respiratory devices can include a man's cotton handkerchief, folded to provide eight layers and placed over the mouth and nose. The handkerchief should

be dry and should be held snugly in place at all times. A dry bath or hand towel in two layers is almost as effective.

In either case, remember that the total effectiveness of such a device depends on a conscientious effort in maintaining a good close fit over the mouth and nose.

Small children should be assisted in maintaining such a fit. (Repeat Message)

Residents of the affected area should stay tuned to this EBS station for further developments and official instructions.

This is not meant to imply that the Nebraska messages are perfect, but they provide more specific information in accordance with established EPA protective action guides than the Missouri sheltering message on p. C-10 which covers the same points, but not as fully.

The Missouri message is repeated, paragraph by paragraph. The Nebraska message is repeated in total.

Q.8. Do you believe these instruction are adequate? Why/why not?

A.8. Yes, I believe that the existing Missouri instructions are adequate, given the limited guidance provided for their development. However, there are changes which could be made to improve them, and I would recommend that they be made.

The messages for in-house sheltering should be informational as well as informative. For example, the Missouri message # 5 is informative, but should be expanded to include more detail and more protective action information than is presently offered. People have been conditioned over the years to hear EBS test messages, weather alerts, news bulletins,

etc., quickly and in total - often repeated. It is felt that if the message is subdivided and repeated by section, the full message may not be heard by the public. Also, even though the message is repeated, it should conclude with a repeat of the description of the affected area, prior to informing the audience to remain tuned for further details. Area identification at both the beginning and conclusion of the broadcast should isolate the affected area and reduce confusion and fear.

ADDENDUM TO NRC STAFF TESTIMONY

Reed Contention 6 reads as follows:

#6. PROTECTIVE ACTIONS AGAINST RADIOIODINE (DRUGS AND EQUIPMENT)

A range of protection actions have not been developed for the plume exposure pathway EPZ for local emergency workers or the public which protect against direct or ingested radiation as is required by 10 C.F.R., Part 50, Section 50.47(b)(10) and NUREG-0654, II, J, which includes provisions for the use of radioprotective drugs, particularly for emergency workers and institutionalized persons whose immediate evacuation may be infeasible or very difficult. Such provisions must include quantities, storage, and means of distribution (see NUREG-0654, II, J, e).

A. Evacuation is considered the most protective action for members of the public in a radiological accident (SOP, pg. 8-4) but constraints and disadvantages may make it inappropriate, such as arrival of the plume in mid-evacuation, etc. Evacuation is a last resort (SOP, pg. 8-3).

B. Shelter is, therefore, the primary protective action but good protection in a dwelling is limited (EPA-520/1-75-001, 1.6.3.2):

--, shelter provided by dwellings with windows and doors closed and ventilation turned off would provide good protection from inhalation of gases and vapors for a short period (i.e. one hour or less) but would be -- ineffective after about two hours --.

No effective course of action is proposed for sheltering after that period. Use of ad-hoc respiratory devices in lieu of other effective methods of

preventing inhalation or ingestion of nuclides such as radioactive iodines for extended periods of time places public health and safety in jeopardy.

(1) Use of potassium-iodide as a protective option by residents in the plume exposure pathway EPZ is rejected in the proposed Off-site Plan, page 9-5, item I.

(2) Potassium-iodide is not provided for optional use by local emergency workers, nor is respiratory protection that meets NRC standards for use in a radiological environment.

(3) Local governments' proposed SOPs state that because of safety, economic and legal considerations, the decision to evacuate should be the protective action of last resort (see SOPs, Proc. #8, 4.3). Of the two options discussed in the SPOs, shelter and evacuation, the State has decided to evacuate rather than issue KI; however, shelter without the benefit of KI is the primary protective action to be considered in an accident involving a release of nuclides from the plant. Pre-school children, pregnant women and all females of childbearing age who are advised to stay indoors (shelter mode) without KI or respiratory protection are subject to thyroid damage or its destruction in themselves and/or the children in utero.

C. The State of Missouri has refused to provide radioprotective drugs, i.e. prophylactic iodine, for either emergency workers or the general public. The Bureau of Radiological Health has decided that evacuation is a more feasible logistical response for protection against radioiodine than is issue of potassium iodide (KI) (see State of Missouri RERP, page B11, H.).

(1) Radioiodines contribute significant exposure modes to whole body exposures, thyroid exposure and lung exposure (see NUREG-0654, page 18, Table 3).

(2) The principle inhalation dose will be from iodines and particulate material in the plume. Due to the ability of the thyroid to concentrate iodine, the thyroid dose resulting from inhalation of radio-iodines may be several times greater than the corresponding whole body external gamma dose that would be received (State RERP, Annex B, C.2).

D. Selection of two options as a range of protective actions without including suitable protective support equipment or chemical prophylaxis to enhance the effectiveness of a selected option over time renders said option to be ineffective under the definition of the two options contained in the SOP, pages 8-3, 8-4, and 8-5.

E. The U.S. Food and Drug Administration has found the use of potassium-iodide (KI) to be safe and effective as a thyroid blocking agent to prevent the uptake of radioactive iodines by the thyroid glands. Since said Federal agency has publically rendered such judgment on the use of KI, it is felt that said KI should be made an optional defensive measure that the general public can take in a sustained shelter situation to protect against thyroid damage or loss, especially in children/infants. Public warnings on packages/bottles can advise of possible reactions to use of this drug by persons who are allergic to KI (similar to the warnings on cigarettes and patent medicines), if officials are concerned about ingestion of KI by alergenic residents of the EPZ.

F. NUREG-0654, page 63, J. Protective Response, e, states:

Provisions for the use of radioprotective drugs, particularly for emergency workers and institutionalized persons within the plume exposure EPZ whose immediate evacuation may be infeasible or very difficult, including quantities, storage, and means of distribution.

Such evaluation criteria is applicable to State and Local governments and indicates that use of KI or similar drugs is a required criteria for a satisfactory plan (see NUREG-0654, page 5, lines 13-15):

FEMA and NRC regard all of the planning standards identified herein as essential for an adequate radiological emergency plan.

G. Common sense and reason indicates that a situation such as this is not in the best interest of providing protection for the public health and safety. If a situation precluding evacuation is possible, and shelter phases may exceed two hours (the effective limit of homes -- see SOP, Procedure #8, 5.1.1) and the public is to be afforded protection from radioiodines, KI or some other thyroid protective drug or device must be made available to sheltrees.

Reed Contention 16 reads as follows:

#16. MESSAGES WITH INSTRUCTIONS FOR LONG-TERM SHELTERING

State and local governments shall provide written messages intended for the public which shall include the appropriate aspects of sheltering, ad hoc respiratory protection, thyroid blocking or evacuation (see NUREG-0654, II, E.7.). Messages contained in the proposed Offsite Plan does not provide for instructions relating to thyroid blocking or respiratory protection if prolonged sheltering is necessitated.

A. Ad hoc respiratory protective devices (handkerchief or towel over mouth and nose, etc.) are known to be less effective than filter-type respirators whose effective lifetime under use is from 2 to 3 hours (see EPZ-520/1-75-001, Chapter 1, 1.6.3.4, page 1.40, lines 13 & 14) and shelter in buildings suitable for winter habitation (see SOP, Procedure #8, 5.1.1) will provide reasonably good protection for about two hours. Given these facts, reasonably adequate respiratory and thyroid protection is provided if shelter is restricted to two or three hours. In cases of flooding, snow and/or ice on area roads; travel in rural areas of all counties have been curtailed for days. In the event of an accident/release of nuclides, shelter must be considered necessary for as long as two to four days. In such circumstances, residents are placed in a situation wherein they cannot move out of the area and do not have protective options which insure their safety if they stay. This situation clearly places public health and safety at risk.

B. Instructions in the Offsite Plan and SOPs must be rewritten to include instructions for the provision of long term shelter instructions which are available to residents who will be advised to take shelter versus evacuation in the event of an accident/release of nuclides at the plant.

MARY MARLEE CARROLL
STATEMENT OF PROFESSIONAL EXPERIENCE AND EDUCATION

EXPERIENCE

11/81 to Present - Community Planner, Technological Hazards Branch, Natural & Technological Hazards Division, FEMA - Region VII.

Review and evaluate State and Local Emergency Response & Plans for Nuclear Power Plants impacting the 4 State Region. Evaluate and consolidate Regional Assistance Committee (RAC) comments, rectify conflicts, prepare fundings for use by Regional, National, State and local governments as to the adequacy of the plans and their compliance with Nuclear Regulations (NUREGS), guidance memos, and other legislation. Monitor and evaluate State and/or local response during nuclear power plant exercises, serve as team leader for exist interviews with State and local authorities following exercises. Schedule observer assignments for REP exercises. Input exercise results on National Office computer. Assisted Regional Assistance Committee (RAC) Chairman with writing and editing of Radiological Emergency Preparedness (REP) Program Procedure & Manual. Developed site specific annexes for Regional Emergency Response Team's (ERT) Plan for Nuclear Power Accidents. Member ERT. Coordinate REP activities among RAC Members. Project Officer for Nuclear Weapons Accidents. Obtained Secret Clearance 3/82.

10/81 - Detailed to assist in Radiological Emergency Preparedness Program (REP) prior to transfer of assignment.

07/72-10/81 - Emergency Management Specialist/Disaster Assistance Employee.

Served in nearly all program areas and phases of the Disaster Temporary Housing Program across the country through its transition from U.S. Department of Housing and Urban Development (HUD) 07/72-01/79, Federal Disaster Assistance Administration (FDAA) 01/79-08/79 and Federal Emergency Management Agency (FEMA).

EDUCATION & TRAINING

01/83 - Senior Officer Nuclear Accident Course (SONAC), Albuquerque, NM.

10/82 - Alert and Notification System Workshop, Washington, D.C.

06/82 - Radiological Monitor Course, Kansas City, MO.

10/81 - Orientation Training in Radiation Emergency Preparedness Planning, Battle Creek, MI.

05/80 - M.B.A., Finance, Rockhurst College, Kansas City, MO (course work completed 12/79)

05/71 - B.A. Psychology, Rosary Hill College (now Daeman College), Buffalo, N.Y.

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} Docket No. STN 50-483 OL

CERTIFICATE OF SERVICE

I hereby certify that copies of "NRC STAFF TESTIMONY OF DAVID M. ROHRER REGARDING EMERGENCY PLANNING (CONTENTIONS 6 AND 16)" and "NRC STAFF TESTIMONY OF MARLEE CARROLL ON REED CONTENTIONS 6 AND 16" in the above-captioned proceeding have been served on the following by deposit in the United States mail, first class or, as indicated by an asterisk, through deposit in the Nuclear Regulatory Commission's internal mail system, this 24th day of August, 1983:

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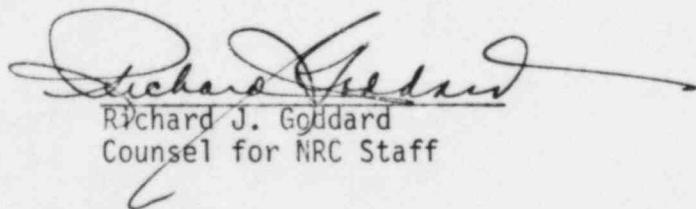
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