

Dated:
4/11/83

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of)	
)	
COMMONWEALTH EDISON COMPANY)	Docket Nos. 50-454 OL
)	50-455 OL
Byron Nuclear Power Station,)	
(Units 1 & 2))	

SUMMARY OF TESTIMONY OF
DAVID D. ED

David D. Ed is the Office Manager for the Office of Technical Support of the Illinois Department of Nuclear Safety (IDNS). His testimony addresses paragraphs 3, 8, and 13 of the amended emergency planning contention insofar as they raise matters related to the role of the IDNS in emergency planning for the Byron Station.

Mr. Ed outlines the responsibilities of the IDNS in regard to emergency planning for the Byron Station. Specifically, he explains the role of the IDNS in the development of the Illinois Plan for Radiological Accidents (IPRA) and the site specific Byron annex to IPRA. Mr. Ed also addresses specific concerns raised by the Intervenor regarding medical services for contaminated injured individuals, the consideration given to the relative protection afforded by the various protective actions, and the interfacing that has occurred between IDNS and the other planning agencies and the emergency response organizations.

Mr. Ed's testimony demonstrates that there is an adequate number of medical facilities capable of providing treatment for contaminated injured persons and radiation victims during a radiological accident. His testimony also demonstrates that sufficient consideration has been given to the relative protection afforded by the various protective actions to assure that an appropriate protective action can be recommended. Lastly, Mr. Ed's testimony demonstrates that IDNS is communicating adequately with other planning agencies and response organizations to assure that an effective plan will be implemented.

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TESTIMONY OF DAVID D. ED

Q1: State your name and present occupation.

A1: My name is David D. Ed. I am employed by the Illinois Department of Nuclear Safety. My personnel code title is Nuclear Safety Executive and my position within the department is that of Office Manager, Office of Technical Support.

Q2: Please describe your educational and professional background.

A2: My formal education background is as follows:

1967-71	University of Illinois, Urbana, Illinois Bachelor of Science in Chemistry Minors in Biology, Psychology
1971	University of Illinois, Medical Center, Chicago, Illinois Partial Course Work in Pharmaceutical Chemistry
1971	University of Chicago Argonne National Laboratory, Argonne, Illinois Environmental Source Term Modeling
1977	United States Nuclear Regulatory Commission Radiological Emergency Operations, Las Vegas, Nevada

1977 Georgia Institute of Technology, Atlanta,
Georgia
Radiological Environmental Monitoring

1980 USNRC/FEMA, Chicago, Illinois
Dose Projection, Accident Assessment, and
Protective Action Decision Making For
Radiological Emergency Response

1982 Harvard University, School of Public Health,
Boston, Massachusetts
Biological Effects of Ionizing Radiation

My professional employment background is as follows:

1980-Present
Illinois Department of Nuclear Safety
Office of Technical Support
Office Manager

1975-80 Illinois Department of Public Health
Division of Nuclear Safety
Manager, Environmental Surveillance
Program

1973-75 Illinois Department of Public Health
Division of Laboratories
Chief, Nuclear Chemistry Section

1972-73 City of Springfield
Utilities Department
Chemical Engineer, Dallman Generating
Station

1971-72 Illinois Environmental Protection Agency
Division of Laboratories
Analytical Chemist

My relevant professional activities and associations are
as follows:

Member Health Physics Society
Sub-Committee on Reporting of Environmental Radiation Data

Alternate to Health Physics Society Steering Committee on
Upgrading the Quality and Usability of Environmental
Radiation Data

Alternate to Radioactivity Sub-Committee International
Joint Commission, Great Lakes Water Quality, Ontario,
Canada

Appointed United States Participant, International Symposium on the Behavior of Tritium in the Environment, International Atomic Energy Agency, San Francisco, California

Co-author "Illinois Plan for Radiological Accidents", technical volumes with Standard Operating Procedures

Member, Steering Committee for the Investigation of Tritium Migration at the Sheffield Low-Level Nuclear Waste Disposal Site

Co-designer, Illinois Remote Radiological Monitoring System

Q3: What are your duties with respect to emergency planning at Commonwealth Edison Company's Byron Nuclear Power Station?

A3: As Manager, Office of Technical Support, my duties involve, among other things, managerial and professional administration of three divisions: (1) Division of Laboratories, (2) Division of Electronic Data Processing (computers), and (3) Division of Emergency Planning. In managing the Division of Emergency Planning, I have become involved with emergency planning at Commonwealth Edison's Byron Nuclear Power Station.

Q4: To which contention is this testimony addressed?

A4: My testimony addresses portions of paragraphs 3, 8, and 13 of the amended emergency planning contention which raise matters related to the role of the Illinois Department of Nuclear Safety in emergency planning for the Byron Station.

Q5: Please describe generally the role of the Illinois Department of Nuclear Safety with respect to emergency planning at the Byron Station.

A5: The Department of Nuclear Safety (DNS) is statutorily mandated (Ill. Rev. Stat., Ch. 127, §63(b)17, December 3, 1980) to "have primary responsibility to formulate a comprehensive emergency preparedness and response plan for any nuclear accident", and to "develop such a plan in cooperation with the Illinois Emergency Services and Disaster Agency" (ESDA).

In fulfilling this mandate, DNS and ESDA have cooperatively developed and implemented a plan known as "Illinois Plan for Radiological Accidents" (IPRA). This plan is comprised of two major components: (1) Technical (nuclear/radiological) functions, and (2) Operational (non-nuclear) functions. The former is logically the responsibility of DNS and the latter is executed by ESDA.

At present, the DNS staff (excluding myself) dedicated to maintaining the technical functions of IPRA are as follows:

- 1 - Health Physicist V
- 1 - Health Physicist IV
- 3 - Health Physicist III
- 1 - Health Physicist II
- 2 - Nuclear Safety Specialist I
- 1 - Electronics Technician II

This staff currently maintains the DNS planning effort at four operating nuclear generating stations (Dresden, Quad Cities, Zion, LaSalle). These efforts are being expanded to include three (3) additional nuclear generating stations under construction (Byron, Braidwood, Clinton). Activities include developing and continuously upgrading the technical (nuclear/radiological) portion of IPRA. This involves defining, implementing, testing and revising, from a technical perspective, those actions that would be undertaken by state, local, federal and private entities in an effort to assess and subsequently reduce/alleviate any adverse health/environmental consequences of a nuclear accident. Additionally, this staff trains and retrain between 5,000 to 7,000 emergency workers annually throughout the state in the principles of nuclear radiation and how one protects oneself from such when assisting in response to nuclear accidents.

Q6: What are the planning criteria and bases for those portions of IPRA for which the Department of Nuclear Safety is responsible?

A6: The department utilizes a variety of technical and regulatory documentation, tempered with insight from our own professional staff, in establishing the planning criteria for those portions of IPRA which fall under the purview of DNS. The primary regulatory guidance is derived from NUREG 0654/FEMA-REP, Rev. 1.

Q7: Has IPRA been tested and reviewed in conjunction with planning drills conducted at other nuclear power plant sites in the State of Illinois?

A7: Yes. IPRA has been successfully exercised nine times at four sites (Dresden (3), Quad Cities (2), Zion (2), LaSalle (2)) over the past few years. At each exercise, activities of state and local governments in Illinois have been judged to be capable of protecting the EPZ populations living near nuclear power stations.

Q8: What is the status of site specific planning being conducted by the Department of Nuclear Safety with respect to the Byron Station?

A8: DNS initiated site specific planning for the Byron Station February 8, 1983. This planning involves several steps. First, a review of the preliminary plan has been completed, and appropriate changes reflecting DNS operations have been submitted to ESDA for incorporation into the first revision. Second, DNS is in the process of contacting local officials and groups identified as emergency workers to determine requirements for dosimetry equipment and training. Third, DNS will make arrangements to distribute dosimetry equipment and schedule emergency workers' training.

Q9: To your knowledge, is the Byron site specific

IPRA going to be reviewed and tested in the context of an emergency exercise?

A9: Yes. Federal regulation requires that IPRA be successfully exercised annually at each operating nuclear station in Illinois. IPRA and its site specific volume for Byron will be tested during an exercise, presently scheduled for late Summer, 1983.

Q10: Please describe the plans for decontamination of individuals who may be contaminated as a result of a release from Byron.

A10: During the development of the Byron volume of IPRA, certain facilities outside the direct exposure EPZ will be identified as being appropriate decontamination/relocation centers. At Byron, approximately 20 such facilities are anticipated to be identified (e.g., schools, armories, etc.). These sites will be identified in Section P-4 of the site specific plan (IPRA Vol. 6). The decontamination procedures to be utilized at these sites are outlined in 4-SOP-8, 4-SOP-9 and 4-SOP-10 of the generic plan (IPRA Vol. 1). A copy of referenced documentation is attached. (Attachments 2-5).

Q11: What arrangements have been or are being made in the Byron area for medical services for contaminated injured persons?

All: The Standard Operating Procedure for Radiological Decontamination of Personnel (Attachment 4) provides that contaminated injured persons are to be transported to one of the identified hospitals that are prepared to handle contaminated patients. (See Table 2 to Attachment 4.) Any member of the public would come under this procedure if found to be contaminated and injured. (See page 3 of Attachment 3.)

The list of hospitals (Table 2 to Attachment 4) includes numerous hospitals in Illinois and one in Iowa in the vicinity of Illinois' nuclear power plants that DNS has determined are capable of handling contaminated injured persons. These hospitals were selected by DNS based on a consideration of the adequacy of their facilities, their proximity to a nuclear power plant, and their relative expertise in dealing with radiation and nuclear materials. (All hospitals in Illinois that are licensed to handle radioactive materials for medical purposes are required to have decontamination procedures in the event of an accident involving these materials and to have a designated Radiation Safety Officer who is responsible for enforcing decontamination procedures. Radiation Safety Officers are trained and knowledgeable in decontamination procedures and can supervise the safe treatment of a contaminated injured patient). DNS is currently investigating hospitals in the

Byron area to determine those hospitals which are capable of handling contaminated patients. These hospitals will also be added to the list in its next revision.

The list of hospitals prepared to handle contaminated patients also includes those hospitals that are under agreement with the Commonwealth Edison Company to provide medical service for its personnel at its nuclear power plants. The next revision of the list will include the Rockford Memorial Hospital which I understand has agreed with Commonwealth Edison Company to provide medical services for the Byron plant. It is also my understanding that Commonwealth Edison Company has contracted with Radiation Management Corporation (RMC), a nationally recognized expert consultant in health physics, to conduct annual training and drills for the medical and paramedical personnel of the hospitals which are under medical service agreements with Edison.

As part of our responsibilities DNS is prepared to provide any necessary support to hospitals in the treatment of contaminated injured persons. The DNS staff would be in the vicinity of Byron during a radiological accident and thus on hand to provide such support. All hospitals on the list are apprised of the support capabilities offered by DNS.

Q12: Will the local emergency support organizations be aware of the hospitals that are capable of treating contaminated injured persons?

A12: Yes. The list of hospitals is included in the generic and site specific volumes of IPRA, both of which are provided to the emergency response support groups. Each specific group of emergency workers will receive training from both DNS and ESDA personnel as to the content of the generic and site specific Byron volumes and how they affect their emergency responsibilities. At the time of an accident, the information as to which hospitals can treat contaminated injured patients is also readily available by contact with DNS.

Q13: What medical facilities are available that can provide appropriate medical treatment for victims of radiation exposure?

A13: The Northwestern-Memorial Hospital is capable of sophisticated analysis, diagnosis and treatment of radiation induced injuries. This capability includes diagnosis of injuries due to exposure to an intermediate range of radiation exposure, that is a level of exposure which does not lead to outwardly apparent symptoms.

Initial treatment of injury caused by exposure

to radiation is generally treated no differently than a similar injury of a non-radiological origin. As such, radiation victims can receive initial treatment by normally trained medical personnel at most any medical facility.

Q14: Does the emergency plan for Byron consider the relative protection afforded by the protective actions of sheltering, evacuation and administration of potassium iodide?

A14: Yes. The State's position regarding the relative merits of the various protective actions is clearly described in a document entitled "Comparison of Protective Actions That May Be Employed Through Implementation of Illinois Plan For Radiological Accidents". (See Attachment 1.) As stated, the goal of IPRA is to totally eliminate or maximally reduce the dose commitment accumulated by the general population during an accident involving radiation or radioactive materials. Evacuation is clearly favored as the most effective protective action since it reduces radiation exposure to zero if timely achieved. Sheltering is utilized as a protective action only when it is estimated to be more effective in dose reduction than evacuation, i.e. only when timely evacuation is impractical or impossible. For such circumstances, DNS has developed a standard operating procedure which would guide DNS in choosing between evacuation

and sheltering as recommended protective action. This procedure has been approved by FEMA and NRC. The procedure reduces the factors that must be considered in selecting the appropriate protective action to a set of complex mathematical formulae. This mathematical operation considers, among other things, the dose commitment reduction afforded by sheltering. The factors for dose commitment reduction afforded by sheltering are derived from the EPA report entitled "Protective Action Evaluation Part II, Evacuation and Sheltering as Protective Actions Against Nuclear Accidents Involving Gaseous Releases" (EPA 520/1-78-001B). If the predominant type of structure is unknown or of a mixed type, the dose reduction factor used for sheltering is a conservative value assuming a single-story wood frame building, the least protective type of sheltering provided by a permanent structure. The use of such a conservative value for the dose commitment reduction afforded by sheltering is consistent with our policy which favors evacuation. The procedure compares the dose commitment reduction afforded by evacuation with the degree of dose commitment reduction that would be afforded by sheltering. As stated earlier the dose commitment reduction factor provided by timely evacuation is 100 percent. However, if evacuation cannot be completed before exposure to the plume, then the effectiveness of this action is decreased. The dose commitment reduction afforded by delayed

evacuation is simply a ratio of the amount of time it would take to complete evacuation versus the duration of exposure. For example, if the release lasts four hours and evacuation requires two hours, and both commence simultaneously, the dose reduction afforded by evacuation is 50 percent.

As indicated in Attachment 1, the protective action of administration of potassium iodide is effective only for reducing dose commitment to the thyroid gland due to the ingestion or inhalation of radioactive iodine. This consideration, plus the problems associated with its administration, make potassium iodide a protective action not considered appropriate for the general public. Potassium iodide (KI) will, however, be distributed to certain identifiable groups, such as emergency workers and residents of special facilities, who may be present in the EPZ following a general evacuation.

Q15: Has DNS developed its emergency plans for Byron in coordination with other planning officials and the response organizations?

A15: Yes. DNS interfaces with agencies at all levels in the development of emergency plans for Byron. Commensurate with its technical responsibilities, DNS coordinates primarily with technical agencies such as the NRC,

DOE, and with the utility (Commonwealth Edison Company). At the State level, DNS interfaces with the Governor's office and IESDA, which is the central coordinating body for all state agencies in an emergency. A planning team comprised of representatives of ESDA, DNS, and the utility is presently working in the Byron area to develop the emergency plan in coordination with the local response organizations and lay the groundwork for their training. In coordination with IESDA, DNS will participate in such training of emergency workers by providing instruction in radiation protection and the use and operation of dosimetry equipment. DNS provides additional training to Dosimetry Control Officers. Each response organization and special facility will have a designated Dosimetry Control Officer who is trained to monitor the radiation exposure of those people who may be present in the EPZ following a general evacuation, i.e. emergency workers and residents of special facilities. Through regular communications with the Dosimetry Control Officers, all emergency response organizations are apprised of the technical support capabilities offered by DNS to deal with radiological matters.