

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
JOHN C. GOLDEN

Dr. John C. Golden is the Supervisor of Emergency Planning for Applicant and as such is responsible for the Applicant's Generating Stations Emergency Plan (GSEP) and the site specific Byron annex of GSEP. His testimony addresses the portions of paragraphs 3 and 8 of the amended emergency planning contention that fall under the ambit of his responsibilities as Supervisor of Emergency Planning.

Dr. Golden introduces the GSEP and site specific Byron annex to GSEP. He describes the previous testing that has been done of GSEP at Applicant's operating nuclear power plant and confirms that the GSEP site specific annex for Byron will be tested during the scheduled exercise. Dr. Golden explains the ongoing review and revision of these documents.

Dr. Golden then describes the arrangements that are being made by Edison for contaminated injured personnel at its site. He goes on to describe the training that will be provided to those who may be involved in the treatment of

Edison's personnel who have suffered radiological injuries and discusses the trained personnel that will support the trained hospital personnel. Dr. Golden also describes the procedure by which Edison arrives at a recommended protective action. Dr. Golden concludes that, under current procedures, sheltering is recommended only when evacuation is infeasible due to various operational considerations. Accordingly, it is unnecessary to determine the sheltering capability afforded by each specific structure in the EPZ.

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TESTIMONY OF JOHN C. GOLDEN

Q1: Please state your name, present occupation,
and present position.

A1: My name is John C. Golden. I am employed by
the Commonwealth Edison Company ("Edison") as Supervisor of
Emergency Planning. I have been employed by Commonwealth
Edison since January 11, 1971.

Q2: Briefly state your educational and professional
qualifications.

A2: I have a Bachelor of Science in Physics (1962)
from the University of Massachusetts, and a Master of Public
Health (1964) and Doctor of Public Health (1970) from the
University of Michigan. At Michigan I majored in Radiological
and Environmental Health. Prior to working for Commonwealth
Edison, I worked as a Health Physicist for the Florida State
Board of Health (1964-1966) and Sandia Corporation, Albuquerque,
New Mexico (1966-1968).

Q3: Describe your duties and responsibilities as Supervisor of Emergency Planning.

A3: I am responsible for the development, review, coordination and approval of nuclear station environmental radiological monitoring programs and emergency planning.

Q4: To which contention is this testimony addressed?

A4: This testimony is addressed to the portions of paragraphs 3 and 8 of the amended emergency planning contention that relate to my responsibilities as Supervisor of Emergency Planning for Edison.

Q5: Briefly describe the emergency preparedness plan for Byron Station.

A5: The emergency preparedness plan in Illinois for Byron Station is composed of five parts: (1) the generic Commonwealth Edison Generating Stations Emergency Plan (GSEP); (2) the site specific Byron annex of GSEP; (3) the generic Illinois Plan for Radiological Accidents (IPRA Vol. 1); (4) the site specific Byron local plan (IPRA, Vol. 6); and (5) the various plans of the Federal agencies (such as NRC and FEMA). GSEP and the site specific Byron annex of GSEP are in final form and attached as Exhibits 1 and 2 respectively. The other three parts of the plan are addressed by witnesses from the respective agencies.

Q6: Has GSEP been tested and reviewed in connection with exercises conducted at Commonwealth Edison's nuclear power plants?

A6: Yes. GSEP has been successfully tested and reviewed nine times in connection with exercises at Commonwealth Edison's four operating plants, Dresden (1980, 1981, 1982), LaSalle (1980, 1982), Quad Cities, (1981, 1982), and Zion (1981, 1983). GSEP will again be tested and reviewed along with the site specific Byron Annex to GSEP in connection with an exercise at Byron scheduled for the week of August 22, 1983. Prior to this Byron exercise we will test the GSEP twice more, once at Quad Cities in May and once at LaSalle in July.

Q7: Please clarify your statement that the GSEP and site specific Byron annex to GSEP are in final form.

A7: GSEP and the site specific annexes to GSEP are documents which are subject to constant review and revision. GSEP is reviewed annually and on a routine basis. The GSEP annexes are reviewed annually following or concurrently with the GSEP review. Any changes which are deemed necessary as a result of this review process are incorporated into the documents. Indeed, both GSEP and its annexes are being reviewed now.

Q8: What arrangements have been made or are being

made by Edison for medical services for contaminated injured personnel at its Byron plant?

A8: Edison has contracted with Rockford Memorial Hospital to provide emergency services for its onsite Byron personnel who may be injured and contaminated. A copy of this agreement is attached as Exhibit 3. Edison has an agreement with the Byron Fire Protection District to provide any emergency services needed at the Byron plant including ambulance service for the transportation of contaminated injured personnel. (See Exhibit 4, attached.) Edison also has contracted with Northwestern Memorial Hospital in Chicago to provide treatment for its onsite Byron personnel who have been exposed to dangerous levels of radiation. (See Exhibit 5, attached.)

Q9: What facilities will Rockford Memorial Hospital have for treatment of contaminated injured individuals?

A9: The Rockford Memorial Hospital is presently constructing a new wing that will include a new emergency room for general use. This was one of the considerations that led to the selection of Rockford Memorial Hospital as a support hospital for Byron inasmuch as it provides an opportunity to construct the emergency room in a way that will facilitate the treatment of contaminated injured in-

dividuals. The emergency room will have a large buffer area surrounding it to reduce the possibility of spreading contamination to other areas of the hospital where treatment is being conducted. In addition, the physical layout of the new wing minimizes the amount of potential disruption to other hospital areas caused by ingress of patients to the emergency room.

Q10: What training is being provided by Edison for the personnel who will be called on to treat injured contaminated persons?

A10: Edison has contracted with Radiation Management Corporation (RMC) to provide a comprehensive annual training program for Byron plant, Byron Fire Protection District and Rockford Memorial Hospital personnel who may be directly or indirectly involved in the treatment of individuals suffering a radiological injury. (The Edison contract with RMC includes several other services, particularly the availability of RMC's expert consultants, physicians and technicians in an emergency. See Exhibit 6, attached.) The training entails instruction on the treatment of contaminated injured individuals. The RMC training will also include a radiation medical emergency drill based upon an accident scenario. The drill will be monitored, videotaped and critiqued by RMC. RMC will submit two Drill Evacuation Reports, one

relating to the observations made at the station, the other relating to observations made at the hospital. The first annual training for the plant, ambulance and hospital staff is scheduled for June 14, 1983 and the drill and videotape critique is scheduled for June 15, 1983.

The onsite workers at Byron plant and the ambulance personnel of the Byron Fire Protection District already have received Nuclear General Employee Training (NGET) which consists of a full day of training on radiological protection followed by an examination. I believe NGET training was discussed earlier in this proceeding with respect to the ALARA contention. In addition, Edison is attempting to arrange a seminar for physicians in Winnebago County on the subject of treatment of radiological injuries.

Q11: Will any other trained personnel be available to support the trained hospital personnel in treatment of contaminated injured individuals?

All: Yes. The Radiation Protection and Chemistry Department of the Byron plant will provide any needed assistance to hospital personnel in treatment of contaminated injured persons. Personnel from The Radiation Protection and Chemistry Departments of Edison's other nuclear plants will also be available if needed. The Illinois Department of Nuclear Safety (DNS) also has a staff of health physicists that can

provide any needed assistance to a hospital concerning radiological matters, including treatment of contaminated injured persons. Further, RMC has a Radiation Emergency Medical Team consisting of a physician, certified health physicist, and technicians with portable instrumentation. As part of its contract with Edison, this RMC team is available on a 24 hour-per-day basis to provide radiological emergency support. (See Exhibit 7, attached.) In addition, every hospital licensed to handle radioactive medical materials has a Radiation Safety Officer who is trained and knowledgeable in decontamination procedures and can supervise the treatment of a contaminated injured patient.

Q12: Is Commonwealth Edison Company charged with responsibility for recommending a protective action in the event of a radiological incident at the Byron plant?

A12: Yes. In the event of a radiological incident, Commonwealth Edison Company is responsible for assessing the situation, activating other emergency personnel and initiating measures to mitigate or avoid damage to the plant. The event is reported to the state through the Nuclear Accident Reporting System (NARS) which requires that Commonwealth Edison recommend a protective action. It is important to remember that Edison's recommended protective actions are just that--recommendations. The Illinois Emergency Services

and Disaster Agency (ESDA) and the Department of Nuclear Safety (DNS) are responsible for the evaluation of our recommendation and preparing their own recommended protective actions to the Governor or his appointed agent. Only on his order does a recommended protective action become a directed protective action.

Q13: How does Edison arrive at a recommended protective action?

A13: Commonwealth Edison uses the following general procedure in preparing a protective action recommendation:

- (a) The initial step is to classify the emergency condition. This is done through the use of Emergency Action Levels (EAL's). The generic section of the Edison Generating Station Emergency Plan (GSEP) provides EAL's based on those in Appendix 1 to NUREG-0654. The station specific Annex provides the specific initiating conditions for each emergency class. These emergency classes are Unusual Event (the least serious event), Alert, Site Area Emergency, and General Emergency (the most serious event).
- (b) The next step is to determine the potential or actual release of radioactive material.

- (c) The actual or potential release is then used to compute a projection of offsite radiation doses. Assistance may be provided by the Offsite Dose Calculation System (ODCS). The ODCS is a computer-based operation that converts potential or actual releases of radioactive material into projections of offsite radiation doses.
- (d) GSEP Table 6.3-1 suggests a series of protective actions based upon the offsite dose projections, the likelihood that the release will occur, and the accident classification. This table is based on the Illinois Plan for Radiological Accidents and is consistent with Appendix 1 of NUREG-0654. Operational considerations such as warning time, weather conditions, and road conditions, to the extent we have knowledge of them, might alter the recommendations shown in this table.
- (e) The information from Table 6.3-1, as modified by a consideration of the known operational factors, is then transferred to the NARS form and a recommendation is communicated to the state.
- (f) As the incident develops, further recommendations

will be made, such as whether or not to issue and use potassium iodide, whether special contamination control measures should be instituted, or whether there should be interdiction of the food chain pathways. To assist in these later recommendations the radiological status of the offsite environment is measured by environmental teams. Each Edison nuclear station is provisioned so that two such teams may be fielded; support teams would be dispatched from other stations if necessary. The field information provided by these teams is analyzed first by field environmental personnel and later by similar personnel in the emergency operations facility. Recommendations from the environmental group are given to the Station Director or Recovery Manager who then uses these data to formulate a subsequent recommendation.

Q14: Is it necessary for Commonwealth Edison to have knowledge of the sheltering capability of every structure in the EPZ in order to recommend a protective measure to the state?

A14: No. The alternative protective actions Edison will recommend are listed in GSEP Tables 6.3-1, 6.3-2 and 6.3-3. Evacuation potentially provides the greatest degree of protection and should be the primary means of protective emergency action in the event of a radiological release. Inasmuch as sheltering may be implemented in less time than evacuation, it may be the recommended protective action if rapid evacuation is impeded for any reason. In such a case, sheltering is generally intended as a protective action while awaiting further instructions relative to evacuation. Because sheltering is utilized as a protective measure only when evacuation is infeasible, deriving the sheltering capability of every structure in the EPZ would not only be impractical, but would serve no useful purpose.

It should be noted that as GSEP is currently written, sheltering is considered as an alternative to evacuation. In order to consider adequately whether sheltering should be recommended as a protective action, Edison, under GSEP, has utilized a procedure based on a similar Department of Nuclear Safety procedure to evaluate the sheltering versus evacuation option. This analysis uses generic shelter protection factors. However, recent studies indicate that if a potential dose exceeds the PAG, evacuation will always be the recommendation if it is feasible in light of known operational conditions.



Commonwealth Edison
72 West Adams Street, Chicago, Illinois
Address Reply to: Post Office Box 767
Chicago, Illinois 60690

AGREEMENT BETWEEN ROCKFORD MEMORIAL HOSPITAL AND
COMMONWEALTH EDISON COMPANY FOR THE
EMERGENCY TREATMENT OF RADIOACTIVE
CONTAMINATED INJURED PERSONS

The Commonwealth Edison Company owns and operates Byron Nuclear Power Station, other nuclear power stations in operation and under construction and uses radioactive materials in measuring devices in some of its fossil fueled generating stations. Commonwealth Edison is interested in assuring the availability of facilities and personnel for the prompt treatment of injured persons that have radioactive contamination on or in their person.

Rockford Memorial Hospital agrees to provide its facilities and staff for treatment of persons having radioactive contamination on or in their persons. Commonwealth Edison Company agrees to reimburse Rockford Memorial Hospital for appropriate replacement, repair or decontamination of contaminated facilities and to pay the hospital for its staff and other services at its usual rates of compensation. In addition, Commonwealth Edison agrees to provide technical assistance, training and radiation monitoring to help in the treatment of contaminated persons, clean-up or other radiation control measures deemed necessary by the Hospital. If Rockford Memorial Hospital requests, Commonwealth Edison further agrees to provide instructions to staff in radiation protection and control procedures and to initially and periodically review, with respect to adequacy of contamination control, its radiation emergency plans.

AGREED TO:

BY: J. E. Garcia
COMMONWEALTH EDISON COMPANY

DATE: 2/22/82

BY: [Signature]
ROCKFORD MEMORIAL HOSPITAL

DATE: 2/12/82



Byron Fire Protection District

232 W. SECOND STREET JAN 8 3 43 PM '82 BYRON, ILLINOIS
EMERGENCY: 234-2341
ADMINISTRATIVE: (815) 234-4911



January 8, 1982



Commonwealth Edison Byron Station
Byron, Illinois 61010

RE: Fire and Ambulance Protection for Commonwealth
Edison Byron Station;

To Whom It May Concern,

The Byron Fire Protection District will provide any Fire Protection, or Emergency Ambulance Service, to the Commonwealth Edison Byron Station that they require. The Byron Fire Protection District also has Mutual Aid Agreements with many surrounding Fire Districts for any extra support if necessary.

Always at your Service,
Robert E. Dyck, Chief

Byron Fire Prot. District
232 W. Second Street
Byron, Illinois 61010

RED/bjm

File 1E1

PARTICIPATION AGREEMENT

Agreement, entered into this 18th day of March, 1983,
by and between Commonwealth Edison Company, an Illinois corporation
(herein-after called "Edison"), and Northwestern Memorial Hospital,
a not-for-profit corporation organized and existing under the laws
of the State of Illinois (hereinafter called "Northwestern Memorial").

WITNESSETH THAT:

WHEREAS, Northwestern Memorial owns and operates hospital
facilities in the City of Chicago, Illinois; and

WHEREAS, Northwestern Memorial is engaged in providing hospital
care and other related services to all persons admitted as patients
of its medical staff; and

WHEREAS, Northwestern Memorial is affiliated with Northwestern
University for the purposes of providing medical education to students
of such University; and

WHEREAS, Northwestern Memorial maintains capability for primary
and tertiary medical and patient care of persons injured as a result
of exposure to ionizing radiation, including provision of such support
facilities as two laminar flow controlled environment intensive care
units, emergency room facilities equipped for radionuclide decontami-
nation, special instrumentation for measuring the body burden of
radionuclides, cell separator equipment, and other facilities required
for special handling of radiation injury cases within the hospital; and

WHEREAS, such facilities are an integral part of Northwestern
Memorial's medical, patient care, research, and education programs; and

WHEREAS, Edison regards the existence of such a facility as of importance, particularly in the event of an unlikely exposure of its employees, and, under prior agreements, provided financial assistance toward the acquisition and relocation of such facilities, and in consideration thereof received certain preemptive rights to their use; and

WHEREAS, periodic expenditures are required for equipment maintenance and testing, for training of personnel, and other purposes necessary to maintain the aforementioned facilities in a state of readiness for use; and

WHEREAS, Edison desires to assure the continued availability of such facilities and to maintain its preemptive rights to their use;

NOW, THEREFORE, in consideration of the undertakings and of the premises contained herein, the parties covenant and agree as follows:

ARTICLE I. TERM OF AGREEMENT

A. This Agreement will remain in full force and effect for five (5) years from the date hereof, and thereafter until terminated by notice given by Northwestern Memorial 120 days in advance of the date of termination.

ARTICLE II. OTHER CONTRIBUTORS

A. Edison agrees that Northwestern Memorial may solicit and accept other grants and assistance in support of and make use of any or all parts of the facilities committed to the treatment of radiation injuries, provided that such uses do not conflict with the purposes of this Agreement.

B. Northwestern Memorial agrees not to extend preemptive rights for use of such facilities to other persons without written consent of Edison, provided, however, that such consent shall not be unreasonably withheld by Edison.

ARTICLE III. NORTHWESTERN MEMORIAL'S OBLIGATION

A. Northwestern Memorial agrees to maintain a suitable capability of providing primary and tertiary medical and patient care to persons afflicted with injuries from exposure to ionizing radiation, and accordingly will:

1. Make space available within the hospital as required and own and maintain two or more Reverse Isolation Units with laminar air flow, and related ancillary facilities as herein described.
2. Ensure the availability of an adequate staff of professional and other persons qualified in the care and treatment of persons exposed to ionizing radiation.
3. Provide for receiving, admitting, and treating persons with radiation injuries.

It is acknowledged, however, that if Northwestern Memorial performs remodeling and renovation of the Reverse Isolation Units facilities described above, that the operation of these facilities may be restricted for the period of time required to complete the remodeling. Edison agrees that its obligations under Article IV of this Agreement shall continue notwithstanding temporary restriction of facility operation during remodeling; provided, however, that Northwestern Memorial shall provide written notice to Edison at least 30 days prior to any such restrictions.

B. Northwestern Memorial agrees to grant preemptive rights for the use of such facilities to Edison's employees admitted to the hospital, to the extent that such facilities are, in the opinion of the attending physician, necessary to the treatment of injuries involving ionizing radiation. Northwestern Memorial may make such facilities available to employees of other contributors, and may grant them preemptive rights similar to those provided herein with the written consent of Edison. All conflicts as to the use of such

facilities by contributors shall be resolved by the Utilization Committee of Northwestern Memorial's medical staff. It is understood and agreed that the obligation to make payment for treatment of such patients will not be affected by this Agreement.

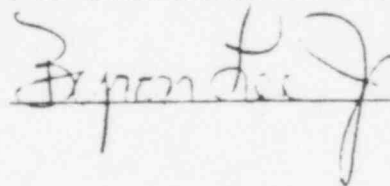
C. Northwestern Memorial agrees to continue the integration of these facilities into its regular teaching and hospital care program.

ARTICLE IV. EDISON'S OBLIGATION

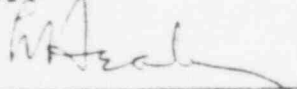
A. In consideration of the foregoing, Edison agrees to pay the sum of \$ 9,000.00 to Northwestern Memorial within twenty (20) days following the date of this Agreement, and to pay such amount each year during the term of this Agreement on or before the anniversary date of this Agreement.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement this 18th day of March, 1983.

For Commonwealth Edison Company



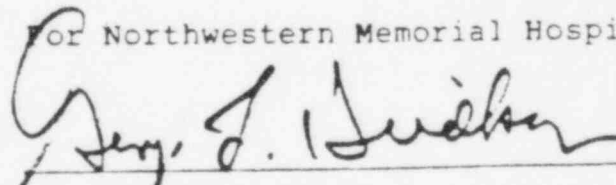
ATTEST:



ATTEST:



For Northwestern Memorial Hospital



Executive Vice President



W.H. Mehn, M.D.
Medical Director
Commonwealth Edison Company
P.O. Box 767
Chicago, IL 60690

SUBJECT: Emergency Medical Assistance Program

Dear Dr. Mehn:

This confirms an agreement between Radiation Management Corporation (RMC) and Commonwealth Edison Company, wherein RMC agrees to furnish certain services to nuclear generating stations operated by Commonwealth Edison Company. These services comprise a program that is identified by RMC as an Emergency Medical Assistance Program (EMAP). With regard to Byron Nuclear Station, the EMAP contains the following provisions:

1. Semi-annual inventories of plant and hospital equipment and supplies for use in handling radiation accident victims; one of these inventories will be in conjunction with (6.) below, and annual review of the hospital procedural manual;
2. Twenty-four-hour-per-day availability of expert consultation on management of radiation accidents;
3. Availability of Bioassay Laboratory for evaluation of radiation accidents;
4. Twenty-four-hour-per-day access to a Radiation Emergency Medical Team consisting of a physician, certified health physicist, and technicians with portable instrumentation to location of accident victim;
5. Availability and access to a medical center equipped for the definitive evaluation and treatment of radiation injuries;
6. Annual training for the plant, ambulance and hospital personnel who may be directly or indirectly involved in the execution of the radiation medical emergency program;
7. Preparation of an "accident" scenario for use as a training aid in a radiation medical emergency drill or review scenario developed by the plant;
8. Coordination of a radiation medical emergency drill based on the scenario; umpired, videotaped and critiqued by RMC;

**radiation
management
corporation**

3508 MARKET STREET
PHILADELPHIA, PA 19104
(215) 243-2950



Byron Nuclear Station

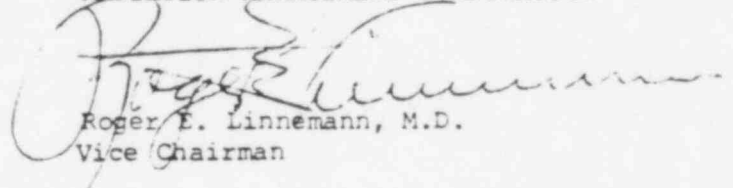
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9. Submission of two Drill Evaluation Reports; one relating to the observations made at the station, and another relating to observations made at the hospital; and.....
10. Participation in an annual one-day seminar in Philadelphia on the management of radiation accidents for physicians. Each plant site may send one person, and each utility company may send one person.

Accident Response

Consultation and laboratory services by RMC personnel are at no charge, except incremental costs associated with consultative activities, such as travel, lodging, collection and transportation of samples, and other related expenses.

RADIATION MANAGEMENT CORPORATION


Roger E. Linnemann, M.D.
Vice Chairman

REL:tc