2/22/83

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
	)	50-455
(Byron Station, Units 1 and 2)	)	

TESTIMONY OF MONTE PHILLIPS ON LEAGUE CONTENTIONS 19 AND 108 AND DAARE/SAFE CONTENTION 3

PHILLIPS SUMMARY

This testimony addresses the emergency planning issues raised in DAARE/SAFE contention 3 and League contentions 19 and 108. It makes the following principle points:

1. The Applicant's onsite emergency plan complies, with some exception, with the emergency planning requirements of 10 CFR § 50.47 and 10 CFR Part 50, Appendix E.

2. The Commission's emergency planning regulations require, among other things, the establishment of a 10 mile plume exposure pathway emergency planning zone (EPZ) and a 50 ingestion pathway EPZ.

3. The developmental bases for the establishment of a 10 mile plume exposure pathway EPZ in the Commission rule include, among other considerations, for the worst core melt sequences, immediate life threatening doses would generally not occur outside the zone and that detailed planning within ten miles would provide a substantial base for expansion of response efforts in the event this proved necessary. Written plans bevond the 10 mile EPZ are not required.

4. Given the generic consideration of a spectrum of serious accidents, the Commission's emergency planning regulations do not require site-specific accident analyses to determine site-specific EPZs. There are no site-specific exigencies at Byron which would warrant departure from the 10 and 50 mile EPZ radii established by Commission regulation.

5. Emergency planning for evacuation by other than gasoline powered vehicular transportation is neither necessary nor feasible. There is no NRC requirement to plan for such a remote contingency.

6. There is reasonable assurance that local and state authorities required to interface in the event of a plant emergency have plans in place. Though not required by regulation, federal plans, including FEMA, the Department of Energy and NRC, are also operational.

7. FEMA has made favorable findings on the Illinois State radiological emergency plan in support of other Illinois nuclear facilities. The Byron site-specific annex to the Illinois plan was prepared December 1982. FEMA projects providing its findings on the adequacy of this plan to the NRC in February 1983.

8. Emergency planning regulations require the conduct of a full-scale emergency exercise to test the onsite and offsite plans

without mandatory public participation prior to operation above five percent of rated power. This emergency exercise is part of the operational inspection process and is not required for an initial licensing decision. The Byron emergency exercise is tentatively scheduled for August 1983.

9. Members of the public within the Byron emergency planning zone will receive necessary information on emergency planning response measures and instructions in advance of plant operation as specified in the emergency plan. This will be verified as part of the Commission's preoperational inspection process.

10. Implementation of protective measures for the offsite public is the responsibility of state and local authorities. The Illinois state plan provides a range of protective actions including evacuation, sheltering, access control and interruption of food pathway.

11. In the event of a general emergency, the immediate preferred protective action is sheltering until an assessment is made that evacuation is needed and, if so, that it can be completed before the release significantly reaches the affected area. If evacuation were the recommended protective action at Byron, there are no areas where evacuation is impractical.

12. Evacuation is recommended only where weather conditions permit and an evacuation time analysis confirms it as the preferred choice. Under serious weather conditions, sheltering in place would be implemented. The Applicant's evacuation time estimates are in accordance with appropriate regulatory guidance. There is no outer bound on evacuation time which is acceptable under NRC regulation.

13. The Applicant has complied with the Commission's emergency planning regulations concerning the provision and location of an Emergency Operation Facility (EOF) and other emergency response facilities. The Applicant's plan does not identify any emergency facility that is located within the plume exposure pathway EPZ other than onsite emergency facilities such as the control room, technical support center and operational support center. Radiological exposure to any person working in these areas would not exceed 5 rem for the duration of an accident, which is well below the point where it could neutralize the effectiveness of personnel.

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TESTIMONY OF MONTE P. PHILLIPS
REGARDING DAARE/SAFE CONTENTION 3 AND LEAGUE CONTENTIONS 19 and 108

Q1. Please state your name and affiliation.

A1. My name is Monte P. Phillips. I am an Emergency Preparedness Analyst with the Emergency Preparedness Section, Emergency Preparedness and Radiological Safety Branch, Division of Radiological and Materials Safety Programs, NRC Region III. A copy of my professional qualifications is attached.

Q2. What is the purpose of your testimony?

A2. The purpose of this testimony is to address the Staff position on DAARE/SAFE Contention 3 and League Contentions 19 and 108 regarding emergency planning.

Q3. Do you adopt the Staff Safety Evaluation Report (SER) section on emergency planning as part of your testimony?

A3. Yes. I have independently reviewed the Byron Annex. This in conjunction with the generic portion of the Generating Stations Emergency Plan (GSEP) was used in the preparation of my SER input for emergency preparedness. In June 1982 both the generic portion and Byron Annex were again reviewed after both these portions of the GSEP had been revised to correct most of the open items (nos. 1, 2, 3, 9, 10, and 11) discussed in Appendix D of the February 1982 Staff Safety Evaluation Report. This review is documented in section

13.3 of supplement 2 to the Safety Evaluation Report (SER).

Q4. Could you please summarize the SER conclusion regarding the Byron emergency plan.

A4. Yes. Appendix D of the SER concluded that the generic GSEP and Byron Annex comply with the Commission's emergency planning onsite requirements in 10 CFR 50.47 and 10 CFR Part 50, Appendix E with certain exceptions. A number of these exceptions or open items have been satisfactorily resolved as documented in SER supplement 2. Although not documented in the supplement, subsequent committments from the Applicant have also resolved the remaining open items.

Q5. DAARE/SAFE Contention 3(a) questions the adequacy of the Applicant's plans because they fail to take into account the evacuation of students attending Northern Illinois University in DeKalb or those without cars at other colleges in the affected area. In a similar regard, League Contention 108(a) contends that Byron emergency planning must encompass a 100 mile radius, including Chicago and Rock County, Wisconsin. Does the Staff have a position on these assertions.

A5. Yes. Evacuation plans for Northern Illinois University in DeKalb are not required by regulation. This University is located approximately 28 miles from the Byron site. Similarly, specific emergency response planning need not extend 100 miles beyond the plant.

The Commission's emergency planning regulations require, among other things, provisions for a plume exposure pathway emergency planning zone (EPZ) about ten miles in radius and an ingestion pathway EPZ about fifty miles in radius. This is specified in 10 CFR 50.33(g) and 50.47(c)(2). The plans for the

ingestion pathway EPZ shall focus on such actions as are appropriate to protect the food ingestion pathway. Protective measures to be taken within the plume exposure pathway EPZ include evacuation, and are specified in 10 CFR 50.47(b)(10), and 10 CFR Part 50, Appendix E(IV). As the Commission stated in the Statement of Consideration when the emergency planning rule was adopted, the prescribed EPZ distances are considered large enough to provide a response base that would support activity outside the planning zone should it become necessary (see 45 FR 55402, 55406 of August 19, 1980).

Q6. What is the basis for the establishment of a ten mile plume exposure pathway EPZ?

A6. The basis for the establishment of a plume exposure pathway EPZ of about ten miles is provided in NUREG-0654/FEMA-REP-1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," Revision 1 (November 1980), Section I(D)(2); referenced in the emergency planning rule itself; and NUREG-0396/EPA 520/1-78-016, "Planning Basis for the Development of State and Local Government Radiological Emergency Response Plans in Support of Light Water Nuclear Power Plants," (December 1978). This includes the following considerations: (a) projected doses from most core melt sequences would not exceed EPA Protective Action Guide levels outside the zone; (b) projected dose from the traditional design basis accidents would not exceed EPA Protective Action Guide levels outside the zone; (c) for the worst core melt sequences, immediate life threatening doses would generally not occur outside this zone; and (d) detailed planning within ten miles would provide a substantial base for expansion of response efforts in the event that this proved necessary. As was stated in the answer to question 5, this does not mean that planning is required beyond ten miles, but that once centers are manned and operational, efforts could be expanded at the time of the emergency in the event it proved

necessary.

Q7. Could you provide an explanation of how accidents are considered in that planning basis?

A7. Yes. The NRC formed a task force with the participation of the Environmental Protection Agency to determine what the basis should be for offsite planning. The principal thing that the task force addressed was accident analysis and consequences. The results of the task force deliberations were published in December of 1978 as NUREG-0396/EPA 520/1-78-016. One of the major conclusions in this report was that no single accident should be singled out on which to base the plans, but a wide spectrum of accidents including core melt accidents should be considered. There were a number of specific sequences considered, and this is described in NUREG-0396, which include the WASH 1400 Class 9 scenarios. The conclusion was that a zone of about ten miles for the plume exposure pathway would provide assurance that even for most of the core melt accidents no actions would have to be taken outside that zone if one uses the EPA Protective Action Guides; and that for the extremely remote accidents, such as the worst case accidents of the WASH 1400 study, that the ten mile area would be the area within which it would be appropriate to focus on life-saving activities. There could indeed be consequences, of course, that would require ad hoc actions outside the ten mile zone for the very large, lowest likelihood accidents; but this was deemed acceptable because of their low likelihood and the fact that, given a zone of about ten miles with detailed planning, one could assume that there was substantial organizational capability in place which would allow some expansion into areas outside of ten miles, even though there were no specific plans for this. All of these considerations are discussed in NUREG-0396, and the major recommendation, which was subsequently

endorsed by the Commission in their Policy Statement entitled "Planning Basis for Emergency Responses to Nuclear Power Reactor Accidents," is that two EPZs should be established around all light water nuclear power plants. The EPZ for airborne exposure has a radius of about ten miles; the EPZ for contaminated food has a radius of about fifty miles (44 FR 61123 of October 23, 1979).

Q8. Since the regulations state that the exact size of the EPZs shall be determined in relation to local emergency response needs and capabilities as they are affected by such conditions as topography, demography, land characteristics, access routes, and jurisdictional boundaries; does a site specific accident analysis need to be performed to determine a site specific EPZ?

A8. No. The conditions which were delineated in the question all relate to local emergency response needs and capabilities, not to accident analysis considerations. The Commission has considered accident analysis considerations to develop the ten and fifty mile radii discussed previously, and has adopted them into rulemaking with the current emergency planning requirements. The conditions that relate to local emergency response needs and capabilities address unique site characteristics that apply to the exact size of the EPZ. For example, if a city were bisected by the radius line, one might incorporate the entire city along jurisdictional boundaries into the EPZ; or if all access routes from a particular area, such as a peninsula, had to pass through the ten mile EPZ, that area could be incorporated into the EPZ; or a particular river boundary near the edge of the ten miles could be used for ease in describing the boundary for a particular protective action. The point is that these are considerations factored into local emergency response needs and capabilities and are utilized by the government officials involved in determining the exact size of the EPZ. No additional accident considerations are required by the regulations.

Q9. Are there any unique siting factors at Byron which would warrant special consideration regarding the exact size of the EPZ?

A9. No. There are no special or unique topographical features or other site-specific exigencies which would warrant departure from the 10 and 50 mile radii that have been identified in the plans (see Chapter I, Section 1, Emergency Planning Zone of the Illinois Plan for Radiological Accidents, Byron Volume VI, Revision 0; page 2-1 generic portion of GSEP; and pages BYA 1-4, 1-5, and 1-8 of the Byron Annex) nor which would warrant departure from the Commission's regulations regarding the size of the plume exposure pathway EPZ at Byron. Provisions for evacuation of populations 28 miles distant from the site, far beyond the reach of the plume exposure pathway EPZ, are not required by the regulations and are unnecessary.

Q10. DAARE/SAFE Contention 3(b) questions the adequacy of the Applicant's plans because they fail to include contingency plans for evacuation of those otherwise able to transport themselves by means of gasoline-powered vehicles in the event of an acute gasoline shortage coinciding with the need for evacuation. Does the Staff have a position on this assertion?

A10. Yes. The Staff does not regard the provision of other than gasoline-powered vehicular transportation as either necessary or feasible. In addition, there is no NRC requirement to plan for such a remote contingency.

Q11. Can you explain the reason for this position?

A11. Yes. The likelihood of such a gasoline shortage which could possibly effect evacuation efforts is simply too remote a contingency to warrant development of specific plans. It is exceedingly unlikely that an acute gasoline shortage would coincide with a plant emergency, let alone of sufficient magnitude to necessitate evacuation. It is similarly unlikely that no warning that such a

shortage was pending would occur, and that even in such an event persons with automobiles would not have enough fuel to depart the affected portion of the plume exposure pathway EPZ, a distance of no more than twenty miles following the most lengthy evacuation route from the facility. For the majority of the affected public no more than about a gallon of fuel is required. In addition, the Illinois Plan for Radiological Accidents, Volume I, Section 6, at page 47 specifies that the Illinois National Guard has 1,200 gallon tanker trucks and 1,200 gallon fuel pods mounted on trucks, as well as 600 gallon fuel pods mounted on trailers. They also have available 5,000 gallon semi-trailer tankers. All have the capability to refuel vehicles directly, including those that use unleaded gasoline. Nowhere in the regulations or guidance criteria (Regulatory Guide 1.101, Revision 2 or NUREG-0654/FEMA-REP-1, Revision 1) is such a contingency required or specified. Therefore, the Staff concludes that special emergency plans for evacuation during a gasoline shortage are not warranted because it is simply too remote a contingency that a gasoline shortage would occur suddenly and at the same time as an accident at the Byron facility that would warrant evacuation.

Q12. DAARE/SAFE Contention 3(c) asserts that the Applicant's plans are inadequate because there is no assurance that local and state and national authorities required to interface will in fact themselves have plans in place which adequately protect the affected public in the event of an accident requiring evacuation. League Contention 108(c) expresses a comparable concern over the opportunity to test the offsite plans for verification of public response. Does the Staff have a position on these assertions?

A12. Yes. They are unfounded. There is assurance that local and state authorities required to interface will themselves have plans in place. In addition, although not specifically required, national authorities currently have a

plan in place which describes this interface. 10 CFR 50.33(g) requires operating license applicants to submit radiological emergency response plans of State and local governmental entities that are wholly or partially within the plume exposure pathway EPZ, as well as the plans of State governments wholly or partially within the ingestion pathway EPZ. 10 CFR 50.47(a) states that no operating license for a nuclear power reactor will be issued unless a finding is made by the NRC that there is reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency. The NRC will base its finding on a review of the Federal Emergency Management Agency (FEMA) findings and determinations as to whether State and local emergency plans are adequate and whether there is reasonable assurance that they can be implemented. These plans are required for the entire ten mile plume exposure pathway EPZ and fifty mile ingestion exposure pathway EPZ and not the smaller LPZ.

Q13. What is the status of the State and local emergency plans?

A13. The Illinois Plan for Radiological Accidents is patterned on a similar basis as the licensee's plan in that it is made up of several volumes which address both State and local emergency plans. Volume I is the State General Plan, Volume II is the Dresden site specific plan, Volume III is the LaSalle site specific plan, and for this site, Volume VI is the Byron site specific plan. Each site specific volume contains the plans on the local level to cover the jurisdictions within that specific plume exposure pathway EPZ. FEMA has made favorable findings on the Illinois State IPRA (Volumes I, II, and III) in support of the Dresden and LaSalle facilities, and the State functions are generic and apply to all Illinois sites. The current Volume VI or Byron site specific plan is Revision 0 dated 12/82. FEMA will provide its findings on the adequacy of this plan to the NRC. These plans must be in place and operational as required by regulation; therefore, there is reasonable

assurance that local and state authorities will have operational plans in place to complement the onsite plans prior to Byron exceeding 5% of full rated power.

Q14. Do these plans have to be tested for verification of public response?

A14. If by this question you mean the actual movement of members of the public, the answer is no. The regulations regarding the testing or exercising of the onsite and offsite plans are very explicit. 10 CFR Part 50, Appendix E(IV)(F) states that a full-scale exercise which tests as much of the licensee, State, and local emergency plans as is reasonably achievable without mandatory public participation shall be conducted for each site at which a power reactor is located for which the first operating license for that site is issued after July 13, 1982, within one year before issuance of the first operating license for full power, and prior to operation above 5% of rated power of the first reactor, which will enable each State and local government within the plume exposure pathway EPZ and each State within the ingestion pathway EPZ to participate. Further, 10 CFR 50.47(a)(2) states that emergency preparedness exercises are part of the operational inspection process and are not required for any initial licensing decision. Therefore, verification of public response is not required, nor for that matter, is an exercise required to issue a license. An emergency exercise is tentatively scheduled for August 1983. It will test the implementation of both the onsite and offsite plans and their interface. Participation by the general public is neither anticipated nor required. The general public in the Byron EPZ will receive necessary information on emergency planning response measures and instructions in advance of plant operation as specified in the GSEP. A preliminary copy of this information was submitted to NRC by letter dated December 15, 1982 from Mr. T. R. Tramm.

The public information brochure will include educational information on radiation, contacts for additional information, a description of protective measures, e.g., evacuation routes, sheltering, respiratory protection, relocation centers, local Emergency Broadcast System (EBS) stations, and instructions for the disabled. Distribution of this brochure is verified as part of the Commission's preoperational inspection process.

Q15. What is the status of non-NRC Federal emergency planning?

A15. Appropriate Federal plans are also operational. FEMA published in the Federal Register on December 23, 1980, the National Radiological Emergency Preparedness/ Response Plan for Commercial Nuclear Power Plant Accidents, otherwise referred to as the Master Plan. This plan assigns responsibilities for the primary responding Federal agencies, provides guidance for the preparation of their implementation plans, and briefly outlines how the Federal response would be managed. Should an accident at a nuclear power plant require Federal response before a consolidated Federal Plan (including agency implementing procedures and plans) is completed, this Master Plan would be used. The FEMA role under the Master Plan includes coordination of Federal non-technical assistance and response activities, assistance in providing for handling evacuees, communications, transportation, and dissemination of public information. A key element of this Master Plan is the assistance Federal agencies can provide in radiological monitoring and assessment. This assistance will be covered in the Federal Radiological Monitoring and Assessment Plan (FRMAP) for which the Department of Energy is responsible. Requesting assistance under this plan is described in the generic portion of the Applicant's plan at pages 4-20, 4-45, 4-46, and Byron Annex page BYA 4-4. Assistance under this plan can be obtained by calling the Regional Coordinating Office of the Department of Energy at Argonne, Illinois. The FRMAP is now in final draft. The FRMAP will take the

place of the current Interagency Radiological Assistance Plan which has been the basis of Federal technical assistance and response to radiological incidents since 1965.

Q16. Does the NRC have an emergency plan?

A16. Yes. The NRC and Regional Office also have their own response plans which are described in NUREG-0728, "Report to Congress: NRC Incident Response Plan," NUREG-0845, "Agency Procedures for the NRC Incident Response Plan," and "NRC Region III Emergency Response Implementing Procedures." This plan provides for a graduated NRC response depending on the severity of the accident. For the more severe accidents the Regional Administrator and his support staff will travel to the facility where he will become the Director of Site Operations (DSO), if appointed by the NRC Chairman. This is in addition to the activation of the Headquarters Operations Center in the Washington, D.C. area. For lesser events the Regional Operations Center is activated. The NRC Plan and procedures are supportive of the FEMA Master Plan. In addition, there is a Memorandum of Understanding between the NRC and FEMA which defines the response roles of each of the agencies and how they will work together during a Federal response to an emergency at a commercial nuclear power plant.

Q17. Are these Federal and State plans discussed in the Applicant's plan?

A17. Yes. As I mentioned before, the means for requesting Federal response through the FRMAP is described in section 4 of the Applicant's generic portion of the GSEP. In addition, a letter of agreement has been executed with the Department of Energy. Section 4.6 of the Applicant's generic portion of the GSEP discusses the participating Federal response organizations, including FEMA, NRC, and DOE. Section 4.7 then discusses the State of Illinois's response. Communication interfaces between the Applicant and the State and local governments are also

described in the Applicant's plan. Letters of agreement have been executed between the Applicant and the Emergency Services and Disaster Agency (ESDA) on the State, County, and municipal levels. The agreement with the State ESDA pledges the support of all State of Illinois agencies that have a role in the Illinois Plan for Radiological Accidents. ESDA will implement protective actions for the public.

Q18. Is there a requirement for adequate Federal emergency plans to exist in order for a facility to receive a license?

A18. No. The Commission's requirements for offsite planning relate to whether State and local emergency plans are adequate and whether there is reasonable assurance that they can be implemented. There is no requirement for Federal plans to be in place.

Q19. DAARE/SAFE Contention 3(d) questions the adequacy of the Applicant's plans because they fail to take into account that, in the event of an accident requiring evacuation, the Applicant and others have plans in place to take emergency measures other than evacuation because evacuation is or may be impractical in many affected areas. Does the Staff have a position on this assertion?

A19. Yes. It is incorrect. Section 6.3.1 of the generic portion and 6.3 of the Byron Annex both discuss plans for implementing or recommending various protective actions for the affected offsite public. These actions include sheltering (staying inside); access control; food, water, and milk control; thyroid protection; and evacuation. Section 6.3.1 of the generic portion of the GSEP states that the EPA report, "Manual of Protective Action Guides and Protective Actions for Nuclear Incidents," will be used as the basis for recommendations to offsite authorities for protective actions for the offsite

public. Section 5.5 of this EPA manual discusses protective action decision-making and identifies sheltering as one of the alternatives to evacuation. The GSEP also states that for incidents involving contamination of food, water, or milk; protective action recommendations will be consistent with the guidance of the U. S. Food and Drug Administration published in the December 15, 1978, Federal Register.

There are circumstances in which evacuation may be impractical for other reasons, such as severe weather. There are specific plans (onsite and offsite) which call for shelter in this type of situation. This factor aside, evacuation is one form, and not always the first choice, of protective action. In fact, NUREG-0654, Appendix 1, states that in a General Emergency the immediate action is sheltering rather than evacuation until an assessment is made that evacuation is needed, and if so, that it can be accomplished before the release significantly reaches the affected areas. The Applicant's plan takes this into account in Tables 6.3-1 through 6.3-3 in the generic portion of the GSEP. If evacuation were the recommended protective action, there are no special or unique geographical features of the plume exposure pathway EPZ which have been identified and would hinder evacuation. From a feasibility standpoint, there are no areas where evacuation is impractical; however, as Table 6.3-1 of the GSEP states, evacuation is the recommended protective action only when weather conditions permit and an evacuation time analysis confirms it as the preferred choice.

The actual implementation of protective measures for the offsite public is the responsibility of the State and local governments. The Illinois IPRA states that the Governor has the responsibility for making decisions on protective actions based upon advice from the Department of Nuclear Safety. This plan

also indicates a range of protective actions, including evacuation, sheltering, access control, and interruption of the food pathway.

The Applicant has also considered protective measures other than evacuation for onsite personnel who must work within the restricted area. This is described in Section 6.4 of the generic GSEP and includes the use of respirators, protective clothing, and thyroid blocking agents. Therefore, contrary to the assertion in Contention 3(d), the emergency plans of the Applicant and State do address non-evacuation protective actions.

Q20. DAARE/SAFE Contention 3(e) and League Contention 19 assert that the Applicant's plans are inadequate because they do not encompass weather-dependent worst case analysis or the potential consequences of a core melt accident with breach of containment in the event evacuation is required. Does the Staff have a position on this issue?

A20. Yes. It is incorrect. First, with regard to core melt accidents, the NRC emergency planning regulations do not require any special or unique plans to account for potential consequences of a core melt with breach of containment. The Applicant's plan does address core melt accidents with breach of containment in accordance with the guidance specified in NUREG-0654, Revision 1. A number of accidents were considered in the development of the Commission's overall emergency planning requirements, including the core melt accident release catagories of WASH-1400, the "Reactor Safety Study." As I said in response to question Q7, a wide spectrum of accidents was considered in the development of the current emergency planning requirements. As stated in NUREG-0396 and endorsed by the Commission, there is no specific accident sequence that could be isolated as the one for which to plan. Further, among the considerations specifically identified as bases for the designation of the ten mile plume exposure

pathway EPZ are the fact that "for the worst core melt sequences, immediate life threatening doses would generally not occur outside the zone" and that "detailed planning within ten miles could provide a substantial base for expansion of response efforts in the event this proved necessary." (See NUREG-0654, page 12). Therefore, emergency planning for potential core melt accidents with and without breech of containment formed an integral part in the formulation of the Commission's upgraded emergency planning requirements to which the onsite and offsite plans must conform. 10 CFR 50.47(b) requires that the Applicant's emergency response plan must meet the standards which are addressed by specific criteria in NUREG-0654, Revision 1. One of these criteria specifies that an emergency classification and action level scheme as set forth in Appendix 1 (of NUREG-0654) be established. The emergency classification "General Emergency" is described as follows in Appendix 1 of NUREG-0654: Events are in process or have occurred which involve actual or imminent substantial core degradation or melting with potential for loss of containment integrity. The Applicant's plan includes this classification, and the appropriate associated emergency action levels in Section 5 of both the generic and Byron Annex portions.

Q21. How does the Applicant's plan deal with weather dependent worst case analysis in the event evacuation is required?

A21. One comment I'd like to make at this point is that if this question relates to determining the size of the EPZ I have already addressed it with regards to Contention 3(a). There are no special considerations required for a "worst case analysis" to be factored into the Applicant's emergency plans. Again this sort of thing relates to the reasoning behind why the EPZ is about ten miles and not some other number, and relates to the conclusions of the Task Force which are discussed in my response to question Q7. Now if this question relates

to the actual implementation of evacuation during severe weather conditions - in other words - a weather dependent analysis of evacuating the people at the time of an accident, this is addressed in the Applicant's emergency plans. The Applicant's plan states that evacuation is the recommended protective action only when weather conditions permit and an evacuation time analysis confirms it as the preferred choice. If evacuation were the recommended protective action, there are no special or unique geographical features of the plume exposure pathway EPZ which have been identified and would hinder evacuation. There are circumstances in which evacuation may be impractical for other reasons, e.g., severe weather, and as such evacuation would not be the recommended protective action. Rather, sheltering in place would be implemeneted. I also discussed this in response to question Q19. In fact, NUREG-0654, Appendix 1, states that in a General Emergency the immediate action is sheltering rather than evacuation until an assessment is made that evacuation is needed; and, if so, that it can be completed before the release significantly reaches the affected areas. The Applicant has taken this into account in Table 6.3-1 of the generic GSEP.

It is a judgement decision by personnel responsible for implementing an evacuation decision during adverse weather conditions as to whether or not it is safe to move people without an undue risk from the weather. As noted above, the state of the weather is an important factor considered in deciding the appropriate response to a given emergency situation. Although weather conditions are referenced in the determination to evacuate, this decision also incorporates an assessment that the evacuation could be completed before the release significantly reaches the affected areas. To perform this assessment, the Applicant utilizes an evacuation time estimate. The Applicant's evacuation time estimates were recently completed and submitted to the NRC on December 15,

1982. These recently submitted evacuation time estimates are in accordance with the guidance provided in Appendix 4 to NUREG-0654/FEMA-REP-1, Revision 1. Due to the late submittal date our findings of acceptability were not included in Supplement 2 of the Staff's SER.

Q22. Could you please elaborate on these evacuation time estimates.

A22. Yes. 10 CFR Part 50, Appendix E(IV) requires that the Applicant shall also provide an analysis of the time required to evacuate and for taking other protective actions for various sectors and distances within the plume exposure pathway EPZ for transient and permanent populations. Appendix 4 of NUREG-0654/ FEMA-REP-1, Revision 1, provides guidance on what information must be provided in the evacuation time estimates. Two conditions - normal and adverse - are considered in the analysis. The adverse weather frequency used in the analysis must be severe enough to define the sensitivity of the analysis to the selected events, such as snow or ice. The evacuation time estimates presented by the Applicant for the general population within the Byron Station plume exposure pathway EPZ have been developed for eight combinations of conditions as follows: (1) summer season, daytime, normal weather; (2) summer season, daytime, adverse weather; (3) summer season, nightime, normal weather; (4) summer season, nightime, adverse weather; (5) winter season, daytime, normal weather; (6) winter season, daytime, adverse weather; (7) winter season, nightime, normal weather; and (8) winter season, nightime, adverse weather. In addition, to address the weekend events, additional analysis was undertaken. These weekend events include the Autumn on Parade and large weekend events at the Byron Dragway and Motosport Speedway.

The method for determining that the evacuation could be completed before the release significantly reaches the affected area is described in the Applicant's

Emergency Plan Implementing Procedures (EPIPs), and can be summarized as follows: (a) the amount of time from the current time until a particular area would be exposed to a dose in excess of the EPA Protective Action Guides is determined; (b) this time is then compared to the evacuation time estimate appropriate to the season, time of day, and weather conditions; (c) an evacuation is confirmed if the evacuation time estimate is less than the time required to exceed the Protective Action Guide dose.

Q23. League Contention 19 asserts that Byron cannot be evacuated in an acceptable time frame. Does the evacuation time estimate bear this out?

A23. I'm not sure I understand what you mean by an acceptable time frame. There may be some misunderstanding here of what is meant in the regulations by the phrase "adequate protective measures can and will be taken in the event of an emergency." This phrase does <u>not</u> say acceptable evacuation can be completed prior to any release, as this contention implies. Protective measures can range from alerting the public that an emergency exists, to sheltering, access control, on up to evacuation. The regulation relates to the ability of onsite and offsite authorities to implement the appropriate protective measure, which may or may not be evacuation. I've already discussed in my answers to several questions the kinds of decisions that take place in the determination of what is the appropriate protective measure, and the actual measure that will be implemented is very much dependent on the course of the emergency. There is no such thing as an acceptable time frame, rather, the issue is which protective action do I chose - sheltering or evacuation - depending on the events that occur. If evacuation cannot be accomplished prior to the release, then the protective action choice may be to shelter. This is still an adequate protective measure when compared to taking no action.

There are two principle reasons for making evacuation time estimates. First,

during the process of making the estimates, one identifies potential bottleneck or congestion areas where queuing or backup could occur; second, and the major reason, these estimates provide decision makers with information on which to base a protective action choice between sheltering and evacuation. The results of the Byron Evacuation Time Estimates indicated that for the eighty baseline evacuation scenarios no queuing or backup on the evacuation road network occurred. The major use of these evacuation time estimates is to determine what the appropriate protective action choice should be, in other words, whether an evacuation is doable, and not to set any upper bounds. In fact, there is no upper bound on evacuation time which is acceptable under the NRC regulations.

Q24. On the subject of evacuation, League Contention 108(b) asserts that the Applicant's plans do not take into account the social and economic costs of evacuation. Does the Staff have a position on this assertion?

A24. Yes. Evaluation of these costs is not required in any NRC regulation. The Staff recognizes that such costs do exist, but in the rule making that was conducted by the NRC, specific provisions addressing the protection of property were deleted from the previous version of Appendix E. In addition, in the Statement of Considerations adopting the rulemaking (see 45 FR 55408), the Commission stated that the question of whether the NRC should or could require a utility to contribute to the expenses incurred by State and local governments in upgrading and maintaining their emergency planning and preparedness is beyond the scope of the present rule change. The Applicant's plans with regard to financial protection from any costs related to the operation of the facility are addressed in 10 CFR Part 140. The exact amount of protection required is specified in the part, and no analysis of the social or economic costs of evacuation is required.

Q25. Lastly, League Contention 108(d) asserts that the emergency facilities (including both personnel and physical facilities) are not situated far enough from the Byron site so as to be free from any impact which could neutralize the effectiveness of such personnel and facilities in the event of an accident. Does the Staff agree?

A25. No. The Commission's regulations concerning the Emergency Operations Facility (EOF) and other emergency response facilities are specified in 10 CFR 50.47(b)(8) and 10 CFR Part 50, Appendix E(IV)(E). Guidance to meet these requirements is given in NUREG-0654, Revision 1; NUREG-0696; and Supplement 1 of NUREG-0737 (formerly known as SECY 82-111B). The Applicant has complied with NRC guidance as described in the SER with regard to the location of the EOF. Since it is located between ten and twenty miles from the site, no backup EOF is required. The Applicant's emergency plan does not identify any emergency facility that is located within the plume exposure pathway EPZ other than onsite emergency facilities such as the Control Room, Technical Support Center (TSC), and Operational Support Center (OSC). By complying with the above mentioned guidance documents, facilities exist onsite such that radiation exposure to any person working in the TSC, OSC, or Control Room would not exceed appropriate emergency worker Protective Action Guides. The habitability of the TSC and Control Room are such that persons working in them would not exceed 5 rem for the duration of the accident, which is well below the point where it could neutralize the effectiveness of the personnel. With regards to offsite facilities located outside the plume exposure pathway EPZ, there are no special habitability requirements in any NRC regulation or guidance document for these facilities.

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1980 - 1982	Radiation Specialist - Inspected all types of Commission licensees authorized to possess, use, and process nuclear materials. Observed, evaluated, and issued notices and reports as to the status of compliance with requirements of the Commission and the safety of licensee operations. Performed all types of investigations which involved material licensed or subject to license by the Commission. Inspected licensees with respect to their emergency planning and environmental monitoring programs and performed confirmatory measurements. (NRC)
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