Staff's written post-IV response

OCT 9 1979

FILE

MEMORANDUM FOR: Chairman Hendrie
Commissioner Gilinsky
Commissioner Kennedy
Commissioner Bradford
Commissioner Ahearne

THRU: Executive Director for Operations

FROM: Harold R. Denton, Director
Office of Nuclear Reactor Regulation

SUBJECT: EPICOR--II

I am enclosing further staff analyses of public comments on EPICOR-II.

Original signed by
E. G. Case

Harold R. Denton, Director
Office of Nuclear Reactor
Regulation

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NRC STAFF RESPONSE TO COMMENTS BY

THE SUSQUEHANNA VALLEY ALLIANCE

SECTION 1.0 PROPOSED ACTION

Comment:

Above we have referred to the argument that the EAS is illegally segmented and under these circumstances the NRC should not limit the EAS to clean-up and storage of the contaminated wastes. Furthermore, the EAS does not evaluate the impact of temporary storage, packaging, handling, transportation, and burial of solid waste generated from the clean-up.

Response:

The scope and content of this EA is in accordance with the Commission's Order of May 25, 1979. The environmental impact, including occupational exposure, of temporary storage, packaging, handling, transportation, and burial of solid waste generated from the operation of EPICOR-II is discussed in Section 4.0 (Occupational Exposure) and Section 5.0 (Management of Solid Waste) of the EA.

Comment:

The illegaly segmented EAS does not fully evaluate alternatives, including, discharge alternatives, thereby may preclude development of a more sophisticated system capable of dealing with all the wastes, including the high level waste water. Such a system may be more cost effective and present fewer hazards to public health and safety.

Response:

As stated in Section 1.0 of the EA, the proposed action does not include the disposition of processed water from EPCIOR-II or the processing of the higher level waste water contained in the reactor building and the primary system. Disposition of processed water from EPCIOR-II and the processing of the higher level waste water will be covered in separate environmental

assessments in accordance with the Commission's Order of May 25, 1979. Alternatives to the use of EPICOR-II and the reasons for the selection of ion-exchange technology as the best alternative are presented in Section 6.0.

Comment:

> Although the EAS allegedly does not include the disposal of the decontaminated waste, in fact, projected "discharge" (into the Susquehanna River) underlies the Assessment. On page 22 of the Assessment, under Section 6.0, Subpart 1, the NRC states:
>
> "TMI Unit 2 water can be processed in the existing TMI Unit 1 or 2 radwaste systems. However, since these systems are not specifically designed for handling intermediate-level wastes, the systems are not capable of producing water of sufficient quality for discharge."

Response:

The capability of producing water of sufficient quality for discharge for the system selected to process intermediate-level wastes was one of the design criteria for the system since discharge into the Susquehanna River is one of the alternatives that will be considered in a later environmental assessment. The requirement that the system be capable of producing discharge quality water does not foreclose other options for the disposition of the processed water in anyway.

Comment:

> Although the EAS purports to be an evaluation of the effect of the proposed action on public health and safety, in fact, by its failure to include an adequate treatment and "worst case" analysis, the NRC has not accurately estimated the impact on human health from radiation doses which may occur. Furthermore, ecological impacts have received no consideration whatsoever. The NRC, while it discusses dosage from releases of Xe-133 and I-131, does not translate the dosage into health impact.

Response:

The radiological impact due to the normal operation of EPICOR-II is discussed in Section 4.0 of the EA and includes estimates of expected health effects.

Comment:

This EAS is in the context of the nation's worst commercial nuclear accident. The accident at TMI has and continues to exert great physchological stress on the residents of central Pennsylvania. The population has been sensitized to the danger of radioactive releases from the damaged reactor and the treatment processes. The NRC has ignored this serious problem of the physchological effects of its proposed action.

Response:

The environmental assessment was prepared in accordance with criteria and guidance setforth in 10 CFR Part 51, Licensing and Regulatory Policy and Procedures for Environmental Protection. Although this regulation does not specifically require that physchological effects be discussed in the EA, the staff has considered the potential additional stress placed on the residents of central Pennsylvania from the operation of the EPICOR-II. The staff concludes that the health and safety of the public will not be endangered by the processing of the contaminated water contained in the auxiliary building.

SECTION 2.0 INTRODUCTION

Comment:

The NRC labels Cesium-137 as the "dominate isotopic contributor," but fails to discuss the effect of C_s-137 in human and biological systems. Furthermore, the NRC fails to discuss what other isotopes may be vented to the air (though the EAS does provide for a vent filtration system) or pass through the system, such as tritium. Further, the Assessment fails to treat in any way the chemical interactions of the isotopes in the ion-exchange system. (See Part IV, Technical Comments)

Response:

The EA has not identified Cs-137 as a gaseous effluent from the operation of EPICOR-II nor does the staff expect any release of Cs-137 in the chemical cleaning building ventilation exhaust due to its low volatility. Any airborne Cs-137 which may be generated would be effectively removed by the high efficiency particulate filters installed in the building ventilation exhaust system. As such there is no postulated dose pathway for Cs-137 from the operation of EPICOR-II. The EA identifies I-131 and Xe-133 as the predominant radionuclides expected in gaseous effluents from the normal operation of EPICOR-II. No other isotopes are expected in gaseous effluents which will contribute to the calculated doses presented in Section 3.5 of the EA. It should be noted that I-131 and Xe-133 have decayed to insignificant levels since initial evaluation (i.e., June 15, 1979) and the calculated doses in Section 3.5 represent "upper-bound" estimates of the environmental impact associated with the operation of EPICOR-II. As of October 1, 1979, the I-131 and Xe-133 activity levels are approximately 1×10^{-4} and 1×10^{-6}, respectively, of their activity levels of June 15, 1979. Tritium is not expected in gaseous effluents to any degree which would affect the calculated doses as it will remain in solution as tritiated water in the EPICOR-II system process liquid effluent. The disposition of the tritiated water effluent from EPICOR-II will be discussed in a later environmental assessment. The effect of the chemical and physical characteristics of the waste on the decontamination factor (DF) for the EPICOR-II system will also be addressed in a later environmental assessment.

Comment:

The Assessment should state which radioactive isotopes will be vented, at what concentration, in what amounts and should report the calculations and figures upon which such statements are made. The Assessment should describe the solubility and/volatility of each isotope.

Response:

The revised EA notes that, because of radioactive decay, tank activity levels of the volatile isotopes of I-131 and Xe-133 have decayed to insignificant levels (See previous response) and the corresponding radiological impact of operation of EPICOR-II will also be insignificant (i.e., less than 1×10^{-4} of the doses cited in Section 3.5). The level of activity of volatile, longer lived Kr-85 is also insignificant (nondetectable in sample analysis) and none of the remaining dissolved radionuclides (Cs, Ba and H-3) are considered volatile to the extent they would contribute to doses via the gaseous pathway.

SECTION 2.1 NEED FOR DECONTAMINATION

Comment:

The NRC has not made a clear case to justify the risks of decontamination. The Assessment states but does not explain why decontamination is necessary to maintain safe shutdown.

Response:

See Section 3.0 (Recommendations) of the NRC staff's Discussion of Public Comments and Staff Recommendation on Use of EPICOR-II at Three Mile Island Nuclear Generatin Station, Unit No. 2, October 4, 1979, for a discussion of the need for decontamination and impacts (i.e., occupational exposure) associated with maintaining the safe shutdown of the plant. The need for decontamination is related to reducing occupational exposure in the auxiliary and fuel handling buildings for those worker requiring entry, immobilizing (via ion-exchange) the tank stored radioactivity, providing needed surge capacity for waste water inleakage to the auxiliary building and providing processing and storage flexibility for contaminated water.

Comment:

It appears that EPICOR-II was chosen as a relatively quick method to treat the intermediate waste. Because delay in this case will only make wastewater safer due to decay of radioactive isotopes into stable isotopes, we cannot understand why the NRC staff and Met-Ed wish to rush the decontamination of the stored water.

Response:

Ion-exchange was selected as the most effective and most reliable method of treating intermediate-level waste water. Delaying processing of this water does nothing for the long lived (30 year half-life) dominant isotope Cs-137 and the attendant risks associated with continued storage of unprocessed waste water.

Comment:

As a second rationale for speedy decontamination, the NRC staff cites undue exposure. The Assessment does not describe how the workers are exposed nor do they discuss how worker exposure can be mitigated without processing the wastewater. Extra-shielding and cleaning of contaminated surfaces should be evaluated. It is our understanding that 50% of undue exposure is due to contaminated surfaces and that such contamination is now being removed.

Response:

Workers required to enter the auxiliary building are exposed to direct and airborne radiation from sources such as radioactive waste containing tanks and areas of the building which have never been decontaminated. The radioactivity contained in these stored waters prevents entry into these areas for maintenance or decontamination. In the performance of operational functions, shielding is utilized to the maximum extent practicable.

Comment:

In the EAS a comparison is made between the occupational exposures to be encountered if the EPICOR system is not used and the occupational

exposures from operation of the EPICOR system. The comparison, however, is not adequate in that the entire process from beginning operation of the EPICOR system to end disposal is not evaluated. Furthermore, operating procedures have not been defined to such a level that the number of employees needed in the transfer of spent resins is specified. In order to make the threshold determination concerning the need for the operation of the EPICOR II system, this further clarification is needed to compare the man/rems of exposure in both cases.

Response:

See Section 5.2.3 and new Section 5.2.4 of the revised EA for a discussion of the environmental impacts associated with the transportation and disposal of the spent resins generated from the operation of EPICOR-II. Less than 5 workers will be used to transfer spent resins.

Comment:

Nowhere does the EAS discuss the availability of additional shielding to protect workers while they maintain the Reactor in a safe shutdown mode. It is possible that this additional shielding would obviate the need for the use of EPICOR II and would allow the agency and the company to let the radioactivity decay naturally while they study in greater depth the alternatives available.

Response:

See responses to previous comments on EA Section 2.1 for a discussion of sources of occupational exposure, use of shielding, and the impact and attendant risks associated with continued storage of intermediate-level waste.

Comment:

It is not at all clear that sufficient storage capacity exists for the 245,000 gallons to be processed in the TMI II auxiliary building. It is clear that some of this waste will have to be re-circulated back through tanks from which it came. These tanks

are contaminated wi radioactivity, and some of th: radioactivity would be transferred back to the cleaned up water.

Response:

Tanks currently contaminated with intermediate-level waste will be desludged and decontaminated prior to being used for storage of clean processed water from EPICOR-II.

SECTION 3.2 MODIFICATION OF EPICOR-II

Comment:

The construction, installation, and use of EPICOR I after the March 28, 1979 accident constituted a violation of the Atomic Energy Act in that application for and issuance of a construction permit are required under the Act.

Although the financial interests of the licensee would be served by a fast decontamination method, the NRC staff must under NEPA explore alternatives such as isolating the plant, biologically, from the environment.

Response:

EPICOR-I is a mobile waste processing system which was installed after the March 28, 1979 accident primarily to process Unit 1 waste water prior to the accident. EPICOR-I has been used in accordance with the Commission's Order of May 25, 1979 for the processing of low-level, waste water generated in Unit 1 and Unit 2 waste water having a total activity of less than 1 uCi/ml.

The staff has considered all viable alternatives to the use of EPICOR-II in Section 6.0 of the EA and concludes that the radioactive releases associated with the operation of EPICOR-II will result in off-site doses which are a small percentage of the limits of 40 CFR 190, EPA Uranium Fuel Cycle Standard and the dose design objectives of Appendix I to 10 CFR Part 50. The staff further concludes that the environmental impacts associated with the operation of EPICOR-II will be insignificant (see response to comment on Section 2.0).

SECTION 3.3 DESIGN OF EPICOR-II SYSTEM

Comment:

EPICOR II has no record of operational experience. Bold assurances that it will do the job the NRC staff says it will do are not enough. Ion exchange is not the best available technology, and it does not provide the protection of the environment which would exist if a combination of evaporation, ion-exchange and carbon absorption were used. (See Technical Comments)

Response:

The technology of ion-exchange is well-proven and used in virtually every commercial nuclear power plant in the country. Ion-exchange is more reliable than the technique of evaporation. The staff's EA shows that the environmental impact of the operation of EPICOR-II is insignificant. EPICOR-II has been proof-tested to assure it will operate as designed.

SECTION 3.3.1 DESCRIPTION OF EPICOR-II SYSTEM

Comment:

The NRC staff states the ion-exchange resins will result in 90% removal efficiency for radio-nuclides. The staff fails to state, however, the basis for that assertion. Further it fails to report data on flow rate and resin capacity which would enable independent analysts to evaluate NRC's assertions. Data on the capacity of resin beds is essential because the filtering function terminates when the bed is exhausted. Data on desintegration of the resin beds is equally essential because the resins desintegrate when bonded to radioactive isotopes.

Response:

The EA states that the removal efficiency of each of the 3 resin beds is "greater than 90%" for radionuclides, based on the operating performance

of the similar system, EPICOR-I. The processing rate for EPICOR-II will be approximately 10 gallons per minute. A discussion of resin ion-exchange capacity will be provided in a later assessment. The resins will be "changed out" on radiation level, prior to chemical depletion. The chosen resins will also have an integrated dose capacity (1×10^8 rads) or tolerance well in excess of the doses they will be subjected to onsite.

Comment:

The NRC bases its plan for storage of processed water on the use of tanks from Unit 1. Because this assessment is legally segmented, no plan for Unit 1 is presented, although proceedings for re-opening Unit 1 are going forward. What will happen to water processed through EPICOR-II if Unit 1 is re-opened? We believe that the NRC staff plans to discharge this water into the Susquehanna River. No other alternative is provided in this Assessment.

Response:

The disposition of processed water from EPICOR-II will be discussed in a later assessment and is not a part of the scope of the EA.

SECTION 3.4 DESIGN FEATURES OF SPILL PREVENTION

Comment:

The EAS is extremely sketchy on a worst case analysis. The EAS totally fails to put the radiologic risks of operation of the EPICOR II system into context. The cation demineralizer dose of 400 rems per hour, a nearly lethal dose. The important factor here is timing. Nowhere in the EAS does it differentiate between or put in context the levels of radiation involved in the operation of EPICOR II and compare it to not operating the system. It is not clear from the EAS all the number of steps that will be required to move the radioactivity out of the water and to its final resting point. We have estimated preliminarily that there would be over

200 individual handling steps for each of the resins. This creates the risk of substantial human exposure.

The only "worst case" discussed is a "worst case pipe break," explained as "a break in the liquid waste inlet pipe to the EPICOR II prefilter/demineralizer." (Assessment, p. 11)

Response:

The dose rate cited (400 rem/hour) is the contact dose rate of the spent liner which is shielded and inaccessible, not the dose rate which the operator is exposed to. See Section 4.0 of the EA for the exposure rates to operators during the handling of the shielded liners. The total estimated exposure from the operation of EPICOR-II, including the handling and transfer of spent liners, is 1 to 5 man-rem.

The hypothetical accidents evaluated in Section 3.4 of the EA are considered by the staff to be "worst" that could be expected to happen. The staff analysis of these accidents should now be viewed with the knowledge that the principle isotope, I-131, has decayed to insignificant levels and is no longer a threat to the environment from a postulated release.

Comment:

On page 12 of the Assessment, the NRC staff refers to the HEPA filter and charcoal absorber system and estimates the thyroid dose from normal air ventilation through the filter. But the NRC fails to mention the serious risk of spontaneous combustion and fire in this filter system. In the NRC's Answer to the Susquehanna Valley Alliance's Interrogatories, the risk of fire is described as follows:

3.5.4 Fire

3.5.4.1 Ventilation System
Should they become too hot, the charcoal absorber beds in the ventilation unit could ignite. Upon indication of

ignition of the charcoal bed, the manually actuated fire protection sprays should be cut in.

A fire in the filter vent system would result in serious releases of Iodine 131 to the public. The risk should be thoroughly reviewed in a complete worst-case analysis.

Response:

I-131 has decayed to insignificant levels (see response to comments on Section 2.0) and is not a threat from a postulated fire in the chemical cleaning building ventilation system.

SECTION 3.5 DESIGN FEATURES TO MINIMIZE GASEOUS RELEASES

Comment:

The HEPA filter and charcoal absorber system as described by the NRC staff has, only one radiation monitor. The lack of backup monitors is a problem which permeates this treatment system. If one monitor malfunctions, another one would continue to do the job. Even in the absence of malfunctioning, double monitoring provides a constant check for validating radiation readings.

Response:

An operating and properly calibrated radiation monitor in the building exhaust ventilation system is a requirement for the operation of EPICOR-II. The staff does not require redundant radiation monitors for systems of this type. In the event of a malfunction of the radiation monitor, operation of the EPICOR-II system will stop and grab samples will be taken from the ventilation exhaust on a periodic basis until the monitor is put back in service. The need for and the frequency of grab sampling are contained in the operating procedures for the EPICOR-II system and the plant Technical Specifications.

Comment:

The NRC staff states that "Iodine fixing chemicals" will be added to minimize gaseous releases. Nowhere does the Assessment say what these chemicals are. Most important, the Assessment does not describe the effect such chemical additivies will have on the ion-exchange resins' ability to clean the water. (See Technical Comments)

Response:

Iodine fixing chemicals are no longer necessary during the operation of EPICOR-II since I-131 has decayed to insignificant levels (see reponse to comments on Section 2.0).

SECTION 4.0 OCCUPATIONAL EXPOSURE

Comment:

This section of the Assessment is defective, suprisingly since occupational safety is put forth as the major reason for proceeding with treatment of the radioactive water. Although shielding of the EPICOR II processing area is described in detail, there is little data given as to what kinds of jobs will be performed inside the processing area, what normal maintenance tasks are necessary, what emergency maintenance can be anticipated and what protective measures will be taken.

Further, numerous transfers of the concentrated radioactive resins in casks are clearly anticipated but no data is give as to worker exposure or protection during these transfers.

Response:

Disconnecting EPICOR-II liner hoses, and capping and moving spent liners are the principal activities in the EPICOR-II processing area. Maintenance activities would include pump and valve maintenance and area washdowns, if required. No emergency maintenance is anticipated. See response to comment on Section 3.4 for a discussion of anticipated exposure to occupational workers on the EPICOR-II system, including handling of spent resin liners. The transfers of spent liners is accomplished remotely, using a large crane and all manual handling is outside the shield bell used to make such transfers. The maximum exposure rate on the outside surface of the shield bell is 60 mrem/hour.

Comment:

Transport to off-site disposal facilities is not discussed at all. What protective measures will be taken to eliminate exposures to workers and the public during transport? Again this section refers to "...off-site disposal in an approved facility." Many critical questions are left unanswered here. What kind of disposal site? Where is the facility? Has disposal in a facility received necessary governmental approvals?

Response:

See Section 5.2.3 of the EA for a discussion of packaging and transportation of spent EPICOR-II liners to a licensed burial facility. The spent liners will be shipped to the licensed low-level burial facility located in Richland, Washington, for ultimate disposition in accordance with NRC and DOT regulations.

Comment:

In its discussion of estimated radiation dose rates, the NRC staff never takes the necessary second step - the analysis of the dose and translation into health effects. Clarification and substantiating data are necessary to give the conclusory statements regarding dosage credibility.

Response:

See revised Section 4.0 for a discussion of the expected health effects associated with the operation of the EPICOR-II system.

SECTION 5.2.1 THE INTERIM STORAGE FACILITY

Comment:

In order to monitor potential contamination of groundwater from on-site storage of concentrated radioactive resin beds, the NRC staff proposes that a well is an accurate monitor, more than one should be drilled. The Assessment provides no discussion regarding contamination of the Susquehanna River from the "groundwater" under the island.

Complete geological data is necessary before on-site storage of these high-level radioactive wastes can proceed. The perfunctory treatment of the construction of this on-site radiation-waste storage facility is shocking.

Response:

The NRC staff considers one well to be adequate for monitoring background radioactivity levels and the water table in the vicinity of the storage area. The staff does not expect any contamination of the groundwater because of the dewatered nature of the liners and the multiple barriers of protection provided by the facility, including the liner itself, the drip pan, and the corregated steel cell. The water table in the vicinity of the storage area is monitored to insure no groundwater intrusion at the cell-lower elevation. The "fill" utilized in the construction of the storage area is porous in nature and readily "percolates" rainwater into the ground.

Comment:

Refer to: IV. Technical Comments (Louis J. Kosarek) contained on Page 19 through second full paragraph of Page 29.

Response:

The scope of this assessment does not include the decontamination capability for EPICOR-II. The decontamination capability of EPICOR-II and the corresponding "quality" of its throughput will be provided in a later assessment dealing with the disposition of processed water from EPICOR-II. Prior to processing, samples will be taken from the batch to be processed and analyzed for predominant radionuclides and important chemical properties (pH, boron concentration,

sodium concentration, calcium concentration, etc). In addition, the capability exists for chemical addition to the batch being processed for the purpose of controlling chemical properties (e.g., pH). Resin selection and form will reflect the results of the sampling program. Body feed can also be added, if necessary, to the EPICOR-II filter/demineralizer for crud removal.

Comment:

Refer to: Decontamination Factors starting on Page 29 and ending with first full paragraph on Page 34.

Response:

See response to previous comment. See also the NRC staff's Discussion of Public Comments and Staff Recommendation on Use of EPICOR-II at Three Mile Island Nuclear Generating Station Unit No. 2, October 4, 1979.

Comment:

Process Design of EPICOR II

The process design of EPICOR II as defined in NUREG-0591 consists of a prefilter, cationic ion exchange bed, mixed bed ion exchange, a resin trap, and associated interconnecting piping, pump and tankage. In addition to the EPICOR II system, a gas treatment system is supplied which consists of moisture separators, HEPA filters, charcoal adsorbers, fans, and radiation monitoring equipment. This complete design was chosen as defined in NUREG-0591 to remove suspended solids concurrent with ion exchange, remove dissolved nuclides by ion exchange and remove radioactive gasses which have evolved to the ventilation system from the liquid stored in the auxiliary building tanks. Neither the design of EPICOR II nor NUREG-0591 address the removal of isotopes which are dissolved gasses within the liquor stored in the auxiliary building tanks. Since ion exchange or filtration will not remove dissolved radioactive gases from the liquor (7, 14, 16), the potential exists for the discharge of radioactive gasses via the treated liquor which is the focus of NUREG-0591. Therefore, it is appropriate for NRC to direct attention to the

Response:

Waste water will be processed on a batch basis. Each batch will be sampled and analyzed at the end of processing to determine its later disposition, i.e., storage or reprocessing through the system. There is no space available in the chemical cleaning building for additional tankage.

Comment:

The second potential error in Figure 1 of NUREG-0591 is the recycle of off-spec water for further decontamination by EPICOR II. The document ORNL-4792 (14) specifically addresses the error associated with the recycle of partially decontaminated water to a loaded or partially loaded ion exchange unit. The only means by which such a recycle system can be used is to operate the recycle loop only with virgin resin. It is obvious that the logistics of a recycle operation only on virgin resin is feasable, but such logistics were not specified in NUREG-0591. Hence, a potential error in such a recycle system does exist. Also, within the proper recycle logistics (use of virgin resin) the capacity of the off-spec water receiving tank must be re-assessed to be sure that all of the surge capacity is not used prior to resin change and that the off-spec water is treated only when virgin resin is present.

Response:

The decontamination capability of EPICOR-II will be discussed in a later assessment. Fresh resin can easily be incorporated in the system at any time during the processing of a batch.

Comment:

Additional Comment

Several comments which were contained in NUREG-0591 were nebulous in nature and should be addressed prior to the implementation of EPICOR II. One of these statements is, "the EPICOR II system...has been designed...with no adverse impact on the health and safety of the public." No demonstration nor definition of the capability

of EPICOR II to meet the regulations specified in CFR Title 10, Part 20, Appendix B, Table 2, has been established in NUREG-0591 nor has any previous successful operating experience been demonstrated in NUREG-0591.

Another such statement is "EPICOR II is specifically designed to handle intermediate waste." The design of the EPICOR II system as defined in NUREG-0591 is no more advanced nor different than designs which were discussed in NUREG/CR-0143 (7), ORNL-4792 (14) or NUREG/CR-014 (16) and these data would not justify that a DF larger than 1000 was reliably obtainable from the EPICOR II system. A question which should be answered by NRC is 'what information justifies the fact that EPICOR II will operate as to have no adverse impact on the health and safety of the public which is exposed to unrestricted discharge?'

Response:

EPICOR-II is similar to EPICOR-I which has operated successfully onsite for the past seven months. EPICOR-I performance provides a measure of the minimum expected decontamination capabilities and performance of EPICOR-II. The disposition of processed water from EPICOR-II will be the subject of a later assessment.

Comment:

The limits of radioactivity in the decontaminated water, air exhaust, and release of processed liquids from TMI 2 through TMI 1 are controlled by "pre-determined limits (which) will be specified in the system operating procedures and in the plant radiological effluent technical specifications." As these limits of radioactivity govern the entire operation of EPICOR II and the release of effluent, they should have been addressed in NUREG-0591 because of their critical nature. Hence, these predetermined levels should be defined and made public prior to design or implementation of any decontamination technology because these levels are not governed by the technology such as EPICOR II but are governed by CFR Title 10, Part 20, Appendix B, Table 2, the operating license DPR-73, and NUREG-0432 (Appendix B). The law defines the levels to which the water must be treated, the quality of the water which requires decontamination in light of legal compliance defines the treatment technology that is best suited for the job and all of this should be known before any procurement takes place.

In addition, the statement unproven in NUREG-0591 is, "Therefore, we conclude that processing of the auxiliary building contaminated water through EPICOR II will have no adverse impact," is used as a conclusion. This conclusion is not based upon a criteria nor definition in NUREG-0591 that EPICOR will produce acceptable decontaminated water, hence, this conclusion has no basis for the environment which is external to TMI and unrestricted.

The quote, "Based upon our estimate...we conclude that the operation of this system (EPICOR II) does not constitute a significant environmental impact," plainly is just an estimate and NUREG-0591 presents no hard facts or data which refute the fact that the use of EPICOR II would not cause a significant environmental impact. Plainly, more information and data is required to make a more accurate estimate of the environmental impact of EPICOR II. Simply, this quoted conclusion has no basis because EPICOR II efficiency on intermediate radwaste water has not been demonstrated.

Response:

The radiation monitor for the chemical cleaning building ventilation exhaust will be set at 20% of the limits of 10 CFR Part 20, Appendix B, Table II for gaseous effluents to an unrestricted area. See response to initial technical comments (Kosarek) and revised Section 3.5 of the EA for a discussion of environmental impacts associated with the operation of EPICOR-II.

Comment:

Summary

The comments regarding NUREG-0591 as discussed in the aforementioned text designate that additional data is required to establish the environmental assessment regarding the use of EPICOR II at TMI-2. The additional information required is a fuller characterization of the liquid in the auxiliary building holding tanks concerning:

- total radionuclides in the liquid
- physiochemical environment of the isotopes including valence and solubility
- unreported background constituents (salinity)
- suspended solids
- dissolved radioactive gases

Before a decontamination system is finalized it is recommended that the following activities be conducted:

1. re-evaluate flow schematic in Figure 1 to minimize cross-contamination of treated water

2. re-assess logistics of off-spec water recycle system

3. further elucidate nebulous statements, predetermined operational limits and substantiate conclusions

4. investigate on-site evaporator capacity as defined in NUREG/CR-0143

The conclusions of this comment regarding NUREG-0591 are:

- not enough data are specified concerning the quality of the auxiliary holding tank water to determine if EPICOR II will perform properly
- previous performance of similar systems designates that EPICOR II will not perform within compliance on the stored steam as defined in NUREG-0591
- evaporation is deemed the most appropriate proven abatement technology as based upon required documentation factors (DF's).

Response:

See responses to previous Kosarek technical comments for detailed responses to each of the above conclusions.

Comment:

In addition to Louis Kosarek's summary of Technical Comments above, we conclude that NUREG-0591, the Environmental Assessment is completely unacceptable because:

1. The segmentation of the process invalidates the Assessment at every state of the treatment process.

2. The construction of on-site storage facilities for radioactive resins represents a potentially lethal threat to area residents and aquatic life in the Susquehanna River and no processing of any water whatsoever should be allowed until alternate storage facilities are developed and clearly identified.

3. The NRC staff has failed to analyze the radioactive water properly and has proceeded, without adequate data, to select and construct EPICOR II, a treatment process which does not meet recognized state-of-the-art standards for decontamination.

4. The Assessment fails to provide substantiating, supportive data for the numerous claims made and conclusions drawn by the NRC staff regarding operations and health and safety factors relevant to the water treatment process.

5. The NRC completely ignores the serious psychological stress generated by the whole "clean-up" process and further, attempts to deceive the public with unsubstantiated performance and safety claims, which contributes to further stress and lack of confidence in the NRC.

Response:

1. The EA and its scope were written in accordance with the Commission's Order of May 25, 1979.

2. The impact of resin storage in engineered facilities to area residents is negligible because of extensive shielding and multiple barriers (liner, cell, concrete) of protection from the environment. The contact dose rate on the concrete surface of the facility will be less than 5 mrem/hour and less than 0.001 of this value at the site boundary assuming a simple inverse relationship with linear distance from the source.

3. See responses to Kosarek technical comments.

4. See revised Sections 3.5 and 4.0 of the EA.

5. See responses to comments on Section 1.0 of the EA.