

OCT 12 1971

Docket No. 50-331

Iowa Electric Light and Power Company  
ATTN: Mr. Duane Arnold  
President  
P.O. Box 351  
Cedar Rapids, Iowa 52406

Gentlemen:

On March 10, 1971, the AEC issued Safety Guide 7, "Control of Combustible Gas Concentrations in Containment Following a Loss-of-Coolant Accident," which describes a solution to the safety issue concerning the control of combustible gas that is acceptable to the regulatory staff. In accordance with the Commission's regulation in 10 CFR Part 50.109, we are currently reviewing the possible need for backfitting of plants, such as the Duane Arnold Energy Center, that received a construction permit prior to the date Safety Guide 7 was issued to provide hydrogen control systems other than purging. In order for us to complete our review, we need certain information from you concerning the calculated doses that might result from purging of the Duane Arnold containment after the design basis loss-of-coolant accident using the assumptions given in Safety Guides 3 and 7.

We need the following information:

1. Using the assumptions contained in Table 1 of Safety Guide 7, calculate the time at which initiation of venting would be required and the rate at which venting must continue to keep both the hydrogen and oxygen concentrations below the limits listed in Safety Guide 7. Include consideration of hydrogen that might be produced by metal corrosion, using realistic estimates of temperature as a function of time and any contribution to hydrogen production from containment coatings.
2. Using (a) the fission product release fraction assumptions given in Safety Guide 3, (b) the same fission product removal rates and/or radioactive decay rates used in the evaluation of your design basis LOCA, (c) the accident meteorology applicable for your site, and (d) an equivalent containment leak rate composed of the allowed containment leak rate plus the venting rate, calculate the infinite-time incremental thyroid and whole body doses due to venting alone at both the site boundary and low population zone distances.

OFFICE ▶						
SURNAME ▶						
DATE ▶						

- 3. Repeat the analysis for the design basis LOCA with the effect of venting omitted.

For use in evaluating the acceptability of containment venting as a hydrogen control measure in the context of 10 CFR 50.109, we plan to establish guideline incremental dose values (as determined from items 2 and 3, above) that should not be exceeded as a result of venting operations. We are presently considering 2.5 rem whole body and 30 rem thyroid at the site boundary as guideline incremental doses, beyond which one should consider additional hydrogen control capability. The implementation of such additional capability to limit incremental purge doses to values in the range discussed above, or the implementation of means of controlling hydrogen generation without relying on purging should be included as part of your response to the items requested above, and will be considered by the Regulatory Staff in accordance with 10 CFR 50.109.

We would appreciate your sending this information with the supporting calculations and your views or plans on such hydrogen system capability as discussed above for our review within the next few months. We are available for any desired discussion of the above matters.

Sincerely,

Original signed by  
Peter A. Morris

Peter A. Morris, Director  
Division of Reactor Licensing

cc: R. Lowenstein  
Lowenstein and Newman

(Pg. 2 retyped as per Task Force - 10/7/71)

OFFICE ▶	DRL: BWR-1	DRL: BWR-1	DRL: AD: BWR	DRL	DRL	
SURNAME ▶	SMKari: kls x7791	DFKuth	RSBoyd	FSchroeder	PAMorris	
DATE ▶	10/7/71	10/9/71	10/11/71	10/9/71	10/12/71	

3. Repeat the analysis for the design basis LOCA with the effect of venting omitted.

Should the calculated incremental doses resulting from venting (as determined from items 2. and 3., above) exceed approximately 2-1/2 rem whole body or 30 rem thyroid at the site boundary, then a hydrogen control system not relying on purging alone should be considered for the facility. The implementation of a system that would either control hydrogen generation without purging or limit the doses resulting from purging to values in this range would result in additional, substantial protection for the public in accordance with 50.109. The system design, therefore, should possess the capability to either limit incremental doses to the above values or perform in accordance with the requirements stated in Safety Guide 7.

We would appreciate your sending this information with the supporting calculations and your proposal for appropriate action for our review within the next few months. We are available for any desired discussion of the above matters.

Sincerely,

Peter A. Morris, Director  
Division of Reactor Licensing

cc: R. Lowenstein  
Lowenstein and Newman

Distribution:  
See attached

OFFICE ▶	DRL:BWR-1 <i>amk</i>	DRL:BWR-1	DRL:AD:BWR	DRL	DRL	
SURNAME ▶	SMK:rl:kls x7791	DFK:uth <i>DK</i>	RSBoyd	FSchroeder	PAMorris	
DATE ▶	8/27/71	8/27/71	8/ /71	/ /71	/ /71	

Distribution:  
 Docket  
 AEC PDR  
 Cedar Rapids PDR  
 DR ReadingD  
 DRL Reading  
 BWR-1 File  
 CKBeck, DR  
 MManann, DR  
 SHanauer, DR  
 FSchroeder, DRL  
 RSBoyd, DRL  
 RDeYoung, DRL  
 DSkovholt, DRL  
 TRWilson, DRL  
 EGCase, DRS  
 RRMaccary, DRS  
 DRS/DRL Br. Chiefs  
 SMKari, DRL  
 WMinners, DRL  
 PWallig, OGC  
 Compliance (2)  
 ACRS (16)  
 WNyer (2)  
 Seismic Design Consultant

OFFICE ▶						
SURNAME ▶						
DATE ▶						