

11/9/79

POOR ORIGINAL

ACR255M-0168

PDR 2/5/80

INDICATION OF CORE DAMAGE DURING THE TMI ACCIDENT

BY

Edward G. Abbott

Reviewing the accident's sequence of events from NUREG-0600 shows there were numerous indications of core damage. The indications for fission product release were: 1) reactor coolant samples, 2) effluent radiation monitors, 3) process and area radiation monitors, 4) radiation surveys. Also, excessive fuel cladding temperatures, RCS loop temperature and the sudden increase in the RB pressure indicated core damage.

For the first 24 hours of the accident 20 effluent, 5 process, and 10 area radiation monitor alarms were received. Continuing increases in activity level were also noted. Seven radiation surveys were made some of which had readings of ≥ 1000 R/h. Four reactor coolant samples were taken and three had levels of activity that could not be attributed to a crud burst.

Hot leg RTD's were 720°F and reactor pressure was 1600 psig ($T_{\text{sat}} 605^{\circ}\text{F}$). Voiding and steam generations in the core indicated core damage was imminent or had already occurred. Incore thermocouple readings ranged from 80°F to 2620°F . Although this was less than the temperature at which the clad melts, it was high enough for a zinc-water reaction. In addition, the reactor building pressure spike indicated hydrogen was generated by the above reaction and subsequently burned.

8003060 027

Only once during the sequence of events in the first 24 hours is "fuel Failure" mentioned. When the shift supervisor notified the Pennsylvania Emergency Management Agency, he reports "failed fuel and a small offsite release." For the next nine hours there is no mention of core damage in the sequence of events.

The NRC's emphasis in NUREG-0600 is on "procedures." It simply compares the action of TMI's management and operators with the requirements and steps of their procedures. The report fails to recognize that in the TMI accident the existing procedures were inadequate for the plant's condition. This criticism applies equally to the TMI management during the accident. This is perhaps the reason the indication of core damage were not interpreted as core damage during the initial phase of the accident.

Failure to recognize, take appropriate action and report in response to these conditions should have been addressed more directly in NUREG-0600.