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Consumers Power Company

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US Nuclear Regulatory Commission
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DOCKET 50-255 - LICENSE DPR-20 - PALISADES PLANT -
TMI JUSTIFICATION RESPONSE

Consumers Power Company was requested by letter dated February 5, 1980 to submit information relative to the Implementation of the Category A Lessons-Learned requirements.

The enclosed attachments provide further information to support our contentions of the following:

- the waste gas and chemical and volume control systems are not required to mitigate the consequences of any accident involving fuel damage; and therefore, need not be included in the Systems Integrity and Shielding Review Programs
- justification for component cooling water isolation logic
- high radiation signal as a diverse isolation signal
- allowing the shift supervisor to leave the control room during accident conditions.

The other requirements outlined in the February 5, 1980 letter will be completed as stated in Consumers Power Company's TMI NUREG-0578 Rev. 1 response.

The response time for the information requested by the TMI inspection team was extended to February 27, 1980 per phone conversation between Mr Richard D Silver (NRC) and Mr S R Frost on February 19, 1980.

Steven R Frost

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Palisades Nuclear Licensing Engineer

CC: Director, Office of Nuclear Reactor Regulation
Director, Office of Inspection and Enforcement

FEB 29 1980

Attachments 16 pages

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COMPARISON OF TMI-2 WITH PALISADES
Waste Gas Systems

TMI-2 Sources/System Configurations

Summary

At TMI-2, leaks in the waste gas systems caused several significant radioactive gas releases within the auxiliary building and off site. Gas from the RCS was allowed to leave containment either dissolved in water or as free gas through four major paths through the letdown line in the makeup system, through the sample system, through the reactor building vent header and through the reactor building sump pump discharge line. These paths would all have been isolated on a reactor building isolation signal, had one been received. At TMI-2, however, since reactor building isolation only occurs on containment high pressure, no automatic containment isolation feature was available for the situation which existed.

The following provides a more detailed description of our understanding of TMI-2 gas release paths for comparison with Palisades.

1. Makeup System

   In the TMI-2 makeup system, gases in the reactor coolant being let down can come out of solution and collect in the makeup tank. This tank is manually vented to the waste gas vent header, or, if pressure increases sufficiently, will vent through the makeup tank liquid relief valve to transfer reactor coolant and gas to the RC bleed holdup tanks. The RC bleed tank vents also go to the waste gas vent header. Letdown can be and was also diverted directly to the RC bleed tanks. A key consideration here is that the relief valves on the RC bleed tanks bypass the waste gas system and the absolute and charcoal filters and go directly to the station atmospheric vent. When at least one of these reliefs lifted on March 30 in conjunction with the lifting of the makeup tank

Palisades Sources/System Configurations

Summary

At Palisades, if an accident occurred which <u>did not result</u> in containment high pressure or significant fuel damage, gas from the PCS could leave containment through paths somewhat similar to TMI-2. These paths are letdown flow in the chemical and volume control system (CVCS), sample purge and PCS degas flow-through the NSSS sampling system, possible but highly unlikely flow-through the containment vent header or the containment building sump drain line and one additional path through the primary coolant pump seal controlled bleed-off line. Unlike TMI-2, however, these paths are all automatically isolated in the event of significant fuel damage whether or not there is a breach of the PCS.

1. Chemical and Volume Control System

   As at TMI-2, normal letdown flow will result in gases collecting in the volume control tank, and manual venting will route these gases through the waste gas surge tank and compressors to the waste gas decay tanks. The liquid relief on the volume control tank relieves to the east dirty waste drain tank which, in turn, relieves to the waste gas surge tank.

   Unlike TMI-2, however, if significant fuel damage occurs, letdown will be isolated automatically by the resulting containment high radiation (CHR) signal. The CHR signal also automatically isolates the other sources of primary coolant into the CVC system (discussed later). Since these isolations stop the flow of primary coolant and, therefore, gases into the CVCS, TMI-2 Sources/System Configurations

liquid relief, the result was the massive gas release which measured 1200 mR in the cloud above the plant. The release was also made larger by leaks in the waste gas vent header and the remainder of the waste gas system which released some of the gas being manually vented from the makeup tank at the same time.

At TMI-2, then, continued letdown flow would have led directly to large off-site gas releases even if the remainder of the waste gas system had been leaktight.

In addition, as noted in NUREG 0600, lifting relief valves in the makeup system was considered to be a potentially significant source of the extensive releases of radioactive liquids into the TMI-2 auxiliary building. Again, these releases would have occurred even without leaks in systems or components.

No automatic features existed at TMI-2 to stop letdown flow in this type of situation.

2. RCS Sample System

For RCS sampling, sample purge flow leaves containment goes through the nuclear sampling system and returns to the makeup system just upstream of the makeup tank or returns to the auxiliary building sump. Sample system flow, therefore, contributes to the RCS gas collected in the makeup tank or can result directly in gases being released to the auxiliary building.

The RCS sample line reactor building isolation valves close on reactor building high pressure.

Palisades Sources/System Configurations

this system cannot be a source of fission product gases into the waste gas system.

As discussed elsewhere in the comparison of Palisades CVC system with the TMI-2 makeup system, letdown is not required to mitigate the consequences of any accident.

2. NSSS Sample System

Under normal conditions, Palisades PCS sampling system is similar to that of TMI-2. Primary coolant sample purge flow leaves containment, passes through the NSSS sample system and returns to the volume control tank. Unlike TMI-2, however, another sample system effluent line is provided to the vacuum degasifier tank from which gases are returned to the waste gas surge tank. This path is used primarily when degassing the PCS in preparation for a cold shutdown. At Palisades the normal degassing method is to vent the pressurizer vapor space through the NSSS sample system. Recent plant modifications have been accomplished to install an additional sample system effluent line which allows sample purge and degas flow to return to containment under accident conditions.

If significant fuel damage occurs, the resulting CHR signal automatically shuts the sample line containment isolation valves, CV-1910 and CV-1911, thereby stopping degas or sample purge flow, and eliminating this source of primary coolant and gas. As above, unless the CHR signal clears (highly unlikely), deliberate action must be taken to jumper out CHR relay contacts in the valve control circuits in order to be able to reopen these valves. Palisades Plant Procedure ONP-11 contains specific instructions for this case to divert the sample system effluent back into containment before CV-1910 and CV-1911 can be reopened. This ensures that the fission product gases from sample or degas flow will remain inside containment and not be able to enter the waste gas system.

It should be noted at this point that Palisades has permanently installed hydrogen recombiners inside containment. Hydrogen, therefore, whether from degas flow or from direct release into containment from the PCS, will be controlled to prevent a flammable or explosive concentration.

3. Reactor Building Vent Header

At TMI-2, the reactor coolant drain tank (RCDT) vent connects to the reactor building vent header through two normally closed valves. When the TMI accident occurred, these vent valves were open.

When the EMOV opened, therefore, the entire reactor building vent header as well as the waste gas vent headers outside containment were pressurized with the RC drain tank. Since RCDT pressure peaked at 192 psig before the rupture disc blew, the pressure in these

3. Containment Vent Header

The Palisades equivalent to TMI-2's reactor building vent header is the containment vent header. Two potential sources of PCS gas are connected to this header, ie, the quench tank vent and the primary system drain tank vent. The quench tank can be vented to the header through a normally closed valve. Normally, the only potential source of PCS water and gas to the quench tank will be the pressurizer safeties since the PORVs are isolated during plant operation.

TMI-2 Sources/System Configurations	Palisades Sources/System Configurations
vent headers reached a value somewhere between the relief valve set point of 150 psig and peak RCDT pressure. This caused an early minor release of activity in the auxiliary building through waste gas system leaks. Two hours later when gross fuel failure occurred, this still open path resulted in significant releases of gaseous activity through the waste gas system leaks.	The primary system drain tank is vented to the containment vent header through a pressure control valve. The only direct source of primary coolant into this tank is the relief valve on the primary coolant pump seal controlled bleed-off line. This relief will not lift, however, unless the normal PCP bleed line to the chemical and volume control system is isolated. The containment building vent header is connected via the waste gas surge tank through compressors to the waste gas decay tanks. Unlike TMI-2, however, if significant fuel damage occurred with or without a breach of the PCS, the resulting CHR signal would shut the containment vent header isolation valves, CV-1101 and CV-1102, eliminating this source of gas from the waste gas system.
4. Reactor Building Sump Pump Discharge	4. Containment Sump Drain
The reactor building sump pumps at TMI-2 automatically pump water from the RB sump to the miscellaneous waste holdup tank or the auxiliary building sump tank outside containment. Both tanks vent directly to the waste gas vent header. Automatic closure of the sump pump reactor building isolation valves did not occur because a reactor building high-pressure signal was not received. Uncontrolled automatic pumping of the RB sump, therefore, led to overflow of the auxiliary building sump tank, flooding of the auxiliary building sump and flooding in various areas of the auxiliary building as floor drains backed up.	At Palisades the containment sump gravity drain line goes directly to the dirty waste drain tank through normally closed containment isolation valves, CV-1103 and CV-1104. When the sump level is high, an operator opens these valves to drain the sump and then recloses them. The valves do not open automatically. If by coincidence these valves were open when a safety injection signal were received (caused by low pressurizer pressure or containment high pressure) or if fuel damage occurred to give a CHR signal, these valves would automatically shut. This line, therefore, would not be a source of highly radioactive liquid or gas outside of containment. This containment sump drain line has a second purpose which is pertinent to the matter at hand. This line was recently modified to accept water from the engineered safeguards room sump pumps, sample purge water

TMI-2 Sources/System Configurations

5. NA

Palisades Sources/System Configurations

and pressurizer gas to give the plant the ability to return highly contaminated coolant and gas to containment. Therefore, any leakage from HPSI, LPSI or containment spray as well as any water or gas intentionally brought out of containment will now be returned to containment to eliminate any need to process it in existing liquid or gaseous radwaste systems. If an abnormal condition develops which increases primary coolant gross activity to approximately 10 μc/ml, Palisades Plant Procedure ONP-11 requires that the containment sump drain line be isolated from other radwaste systems outside containment and that any leakage or sample/degas flow be directed back to the containment sump. If an abnormal situation develops rapidly so that the CHR signal is received, this procedure requires that the above action be taken before the containment sump valves may be reopened and PCS sampling resumed.

5. At Palisades, one other potential source of primary coolant and gases outside of containment is primary coolant pump seal controlled bleed off. This primary coolant flow of 4 gpm leaves containment through a separate penetration and goes to the volume control tank in CVCS. If this line is isolated, an alternate flow path totally inside containment would allow the pump seal flow to be maintained without operator action. If significant fuel damage occurs, the resulting CHR signal would shut the containment isolation valve on this bleed-off line and eliminate this source of coolant and gas from the CVC system without affecting the primary coolant pump seals.

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COMPARISON OF TMI-2 AND PALISADES LETDOWN AND GASEOUS WASTE SYSTEMS

References

1. NUREG 0600 - Investigation into the March 28, 1979 Three Mile Island Accident by Office of Inspection and Enforcement

2. Flow Diagrams - Three Mile Island Unit 2

   Dwg 2024, Rev 16
   Dwg 2026, Rev 18
   Dwg 2027, Rev 15
   Dwg 2028, Rev 18
   Dwg 2031. Rev 10
   Dwg 2045, Rev 13
   Dwg 2632, Rev 1

3. Piping and Instrument Diagrams - Palisades Plant

   M-201, Rev 20
   M-202, Rev 21
   M-203, Rev 16
   M-204, Rev 16
   M-210, Rev 14
   M-211, Rev 27 (as Modified by FC-471)
   M-219, Rev 10 (as Modified by SFC-79-075 and FC-471)
   E-17, Sh 3, Rev 7

4. Palisades Plant Normal Operating, Off-Normal and Emergency Procedures

5. NSAC-1, EPRI Report on the Three Mile Island Accident

COMPARISON OF TMI-2 TO PALISADES
Letdown System

TMI Condition/ Requirement for Letdown	TMI Design Features/Use of Letdown System	Palisades Design Features for Accomplishing Letdown Functions
Summary		
	Based on information in NUREG 0600 and NSAC-1, the letdown system of TMI-2 provided the following functions during the TMI-2 accident: 1. Reduction of primary coolant volume. 2. Reduction of primary coolant pressure. 3. Sampling of primary coolant. 4. Degassing of primary coolant. 5. Cooling of primary coolant. Each of these functions is discussed below:	Letdown flow from the primary coolant system to the chemical and volume control system would be isolated in the event of significant fuel damage by containment high radiation (CHR). Thus, normal letdown flow would not be available during an accident such as TMI-2. As discussed below, alternative design features exist or have been added to the Palisades Plant which allow each of those system functions which are required during and following the the accident to be accomplished without letdown flow.
1. Reduction of PCS Volume		
a. During First 15-1/2 Hours	Letdown flow was used in conjunction with EMOV block valve discharge and makeup during the first 15-1/2 hours of the transient in an attempt to maintain a constant pressurizer level. However, based on our review, it appears that letdown flow had only a minor effect on level control and need not have been used. Measured values of letdown flow rate are not available except at isolated times during the TMI accident. Nevertheless, based on the EPRI analysis in NSAC-1, and from infromation in NUREG 0600, it can be inferred that the	Letdown from the PCS to the CVCS at Palisades would be isolated as a result of containment high radiation when significant fuel damage occurs. The charging pumps of the CVCS continue to operate after an SIS to inject concentrated boric acid into the PCS. In addition, the high-pressure safety injection system, which is independent of the CVCS, is available for increasing PCS inventory by drawing borated water from the SIRW tank.

TMI Condition/ Requirement for Letdown	TMI Design Features/Use of Letdown System	Palisades Design Features for Accomplishing Letdown Functions
	letdown flow changed repeatedly between zero flow following reactor building isolation signals and maximum flows near 160 gpm with a most likely average near 70-90 gpm throughout the transient.	
	The primary coolant inventory increases at at TMI-2 during the accident were determined by flow rates through the makeup (and safety injection) system. Typical sustained makeup flows ranged from approximately 150 gpm to approximately 720 gpm based on BWST level measurement and inferred letdown flow.	
	The PCS inventory decreases can be estimated by knowledge of the pressurizer relief (EMOV) and block valve positions (open or closed), and by the letdown flow. Typical flows from the pressurizer were approximately 600 gpm, ie, much greater than the letdown flow.	
	Accordingly, throughout the first 15-1/2 hours of the accident, primary coolant inventory was controlled primarily by the makeup flow and the flow leaving the pressurizer, rather than by the letdown flow. During this period, isolation of letdown flow would not have substantially changed the primary coolant volume. The effect of slightly reducing the coolant loss rate if letdown were isolated would have been beneficial early in the transient.	During a Loss of Coolant Accident, rapid addition of primary coolant rather than inventory reduction is required. Reduction of primary coolant volume through use of the letdown system in effect increases the size of the break and can increase the severity of the transient. If coolant inventory reduction is desired during an accident, this could be accomplished at Palisades by opening the PORVs and block valves on the pressurizer, and discharging the primary coolant to the quench tank and into containment as at TMI.

TMI Condition/ Requirement for Letdown	TMI Design Features/Use of Letdown System	Palisades Design Features for Accomplishing Letdown Functions
b. After 15-1/2 Hours	After 15-1/2 hours when the TMI plant had been brought under control, the letdown flow was continued and approximately matched the makeup flow. In this mode, the letdown system was used to remove coolant volume continuously added to the PCS by the makeup pumps for primary coolant pump seal injection. As discussed below, letdown flow was also employed during this time period for degassing the reactor coolant.	With a full primary coolant system operating in a stable cooling mode at Palisades, charging flow to the PCS will be limited to approximately 4 gpm for makeup of seal leakage in the primary coolant pumps. In addition, the primary coolant pump seals do not require seal injection for cooling or lubrication. Instead, a controlled amount of primary coolant is allowed to bleed through the seals. This 4 gpm total flow (1 gpm per pump) normally leaves containment through a separate penetration and returns to the volume control tank in the CVCS. The same signals which isolate letdown also isolate this controlled bleed off by shutting the containment isolation valve. If this normal seal bleed-off line is isolated or blocked, seal flow would still be maintained without operator action through an alternate path inside containment. Isolation of letdown or the PCP seal controlled bleed-off line would not affect primary coolant pump operation. Thus, reduction of primary coolant volume with the CVCS will not be required during an accident at Palisades.
	It is noted that at TMI the makeup pumps are used for both high-pressure safety injection and normal makeup during plant operation. The design shutoff head is 3,000 psig. Letdown flow during the accident may have been continued as a normal precaution to minimize the potential for plant overpressurization.	The Palisades HPSI pumps have a shutoff head of 1,255 psig and, thus, cannot overpressurize the system as long as temperature is above 255°F (MPT consideration). Consequently, using letdown flow to avoid potential overpressurization by the safety injection pumps would not be a concern at Palisades.

TMI Condition/ Requirement for Letdown	TMI Design Features/Use of Letdown System	Palisades Design Features for Accomplishing Letdown Functions
2. Reduction of Primary Coolant Pressure	a. First 15-1/2 Hours	
	The letdown flow can be used to reduce primary coolant pressure by reducing coolant volume.	
	At the start of the TMI-2 accident letdown flow was increased in an unsuccessful attempt to reduce the rise in pressurized level. This had the adverse effect of increasing the effective size of the break.	Prior to significant fuel failure the letdown system at Palisades would not be isolated and would be availabe for reducing pressure in the PCS if desired.
	Between approximately 5-3/4 and 7-3/4 hours in the accident pressure control was accomplished by periodically opening the pressurizer relief or vent lines. As discussed above, the letdown flow was small compared to the flow from the pressurizer during this period and did not significantly contribute to pressure control.	Following significant fuel failure the letdown system at Palisades would be isolated. If required, PCS pressure reduction would be accomplished through the pressurizer PORVs as was done at TMI.
	During the sustained pressure reduction from 7-3/4 to 9-1/4 hours in the accident the pressurizer relief line was left open continuously. Contribution of the letdown flow to the total pressure decrease was small. This attempt to go into the decay heat system was unsuccessful and only after the plant was repressurized and the primary coolant pumps started was the plant brought to a stable cooling mode.	

TMI Condition/ Requirement for Letdown	TMI Design Features/Use of Letdown System	Palisades Design Features for Accomplishing Letdown Functions
	b. After 15-1/2 Hours After the plant was brought to a stable cooling condition, letdown flow was used together with the makeup system to indirectly control pressure by controlling primary coolant inventory. This action was required at TMI, as discussed above, because of the net inward flow of coolant via the primary coolant pump seals. In particular, a minimum letdown flow of 28 gpm is required to balance the net inflow of 7 gpm per pump from seal injection.	As discussed above under PCS inventory control, primary coolant pump seal flow at Palisades is a PCS outflow and is independent of the chemical and volume control system.
3. RCS Sampling RCS sampling is required to determine the extent of fuel damage.	For RCS sampling, TMI and B&W plants, in general, have two options for obtaining reactor coolant samples. The normal sample point is in the letdown line upstream of the letdown coolers through valve RC-V123. It should be noted that some later B&W plants have this sample point in the letdown line outside containment. The second TMI-2 primary coolant sample point is from the pressurizer liquid space through valve RC-V122. Sample water is returned to the makeup system just upstream of the makeup tanks (used for purging) or through the catch basin in the sample panel to the auxiliary building sump. With this system configuration, the preferred path for purging sample lines to obtain a representative sample would be to the letdown line.	At Palisades, primary coolant samples are normally obtained directly from sample point SX1023 on PCS loop 2 hot leg. Samples can also be obtained from the pressurizer liquid phase through SX-1034 on the surge line. A primary coolant sample may be obtained independent of letdown flow. During normal plant operation, PCS sample water is returned to either the volume control tank (normal lineup for purging) or to the vacuum degasifier tank. In addition, recent plant modifications have been accomplished to add a third sample system effluent line to allow PCS sample purge flow back into containment under accident conditions. At Palisades, fuel damage with or without a breach of the PCS will cause sampling

TMI Condition/ Requirement for Letdown	TMI Design Features/Use of Letdown System	Palisades Design Features for Accomplishing Letdown Functions
	At TMI-2 letdown was used to obtain reactor coolant samples early in the accident.	flow to be stopped when the resulting containment high radiation signal closes containment penetration isolation valves, CV-1910 and CV-1911. These valves remain closed until deliberate action is taken by the operator to prepare to handle the highly contaminated coolant and then jumper CHR relay contacts in the valve control circuits to allow the valves to reopen. If fuel damage occurs, Palisades Plant Procedure ONP-11 requires that the sample return lines to the volume control tank and the vacuum degasifier be isolated and that the system be lined up to direct sample purge flow back into containment prior to reopening CV-1910 and CV-1911. This prevents contamination of unnecessary systems outside containment with the highly radioactive fission products.
4. Reactor Coolant Degassing Degassing of reactor coolant was required following the accident to remove noncondensible gases and to allow RCS pressure reduction.	TMI-2 had two methods to degas: 1. Letdown PCS water through the makeup system and vent any gases from the makeup tank. 2. Use the feed and bleed mode for the makeup system by letting down reactor coolant directly into the reactor coolant bleed holdup tanks, WDL-T-1/A/B/C, Gas from the relief valves on these tanks went directly to the station vent through the relief valve vent header. Gas through the normal vents from the reactor coolant bleed tanks and the makeup tank	At Palisades the normal degassing path is from the pressurizer vapor space through the sample system to the vacuum degasifier tank. Degassing is independent of the CV[illegible] system. Degassing <u>can</u> also be accomplished by venting the volume control tank with letdown flow, but this method is very slow and is considered an alternate to the above. Recent plant modifications have been accomplished which also allow degas flow to be returned to containment under accident conditions. At Palisades, fuel damage with or without a breach of the PCS will cause gas flow

TMI Condition/ Requirement for Letdown	TMI Design Features/Use of Letdown System	Palisades Design Features for Accomplishing Letdown Functions
	go through the WGS compressors to the waste gas decay tanks. At TMI-2, the larges off-site release of noble gases occurred when the relief valves lifted on the RC bleed tanks coincident with gas system leakage during venting of the makeup tank.	to be stopped when the resulting containment high radiation signal closes containment penetration isolation valves, CV-1910 and CV-1911. These valves remain closed until deliberate action is taken by the operator to prepare to handle highly contaminated coolant/gas and then jumper CHR relay contacts in the valve control circuits to allow the valves to reopen. If fuel damage occurs, Palisades Plant Procedure ONP-11 requires that the sample effluent lines to the vacuum degasifier and volume control tank be isolated, and that the system be lined up to direct sample system effluent flow back into containment prior to reopening CV-1910 and CV-1911. This presents contamination of unnecessary systems outside containment with the highly radioactive fission products.
5. Primary Coolant System Cooling	At TMI the letdown flow passes through the letdown heat exchanger before returning to the PCS through the makeup pumps. It was noted in NUREG 0600 that this cooling of the letdown flow provided some cooling of the PCS throughout the TMI accident. However, based on the nominal letdown flow rate of 80 gpm, this cooling was inadequate to remove the decay heat generated in the core until much later in the accident. Core cooling in the absence of effective natural or forced circulation at TMI was accomplished by makeup and relief from the pressurizer at flow rates of approximately 600 gpm, much larger than the letdown flow of approximately 80 gpm.	At Palisades core cooling during an accident will be accomplished by using the steam generator as the heat sink at high pressure and the shutdown cooling system at low pressure. Additional core cooling can be provided by high-pressure injection and primary coolant removal from the pressurizer, similar to the primary cooling mode at TMI for the first 15-1/2 hours of the accident.

JUSTIFICATION FOR COMPONENT COOLING WATER (CCW) ISOLATION LOGIC

Containment penetrations are presently divided into essential and nonessential systems with nonessential systems isolated on a containment isolation signal (CIS). The CCW system which presently isolates on a safety injection signal, SIS, is to be changed to a quasi-essential system, therefore, reducing the chance of primary coolant pump (PCP) seal failures caused by a lack of cooling water due to a spurious SIS. A seal failure could result in a small break LOCA.

The new isolation scheme requires a safety injection signal and either a low level in the CCW surge tank or a containment pressure greater than 20 psi. The philosophy is that the CCW should be isolated on SIS in conjunction with the potential of a CCW line break. If the line does break and the containment is at a pressure of less than 20 psi, then water will flow from the system causing low level in the CCW surge tank. Thus, the logic for isolating.

If a SIS occurs and the containment is greater than 20 psi, and if a break should occur, gases and steam would flow into the CCW system instead of water flowing out because the CCW would be at a lower pressure. These gases could eventually find their way into the environment. To avoid this from happening, the system is isolated under these conditions.

When the system is isolated, the valves are not latched closed as on the nonessential systems, and the CCW is reestablished as quickly as possible for pump seal protection.

JUSTIFY THE USE OF CONTAINMENT HIGH RADIATION SIGNAL AS A DIVERSE CONTAINMENT ISOLATION SIGNAL

The Palisades Plant radiation monitors operate primarily to provide isolation upon high levels of radiation. This provides for a means of containment isolation in the event of coolant loss to the containment volume which may be insufficient to cause isolation on the basis of high-containment pressure.

Location of each monitor is adjacent to an air cooler where radioiodines would condense along with water vapor in the event of even relatively minor breeches of primary system integrity. Radiation monitor locations in the lower level of containment also allow for response from abnormal sump or 590 level water accumulations of radioactive coolant. Such conditions could be hypothesized for rupture of a letdown line after cooling by the letdown heat exchanger, leakage or overflow of the primary system drain tank, etc.

The NRC's TMI inspection team concerns for ability to isolate containment on the premise that significant core damage might occur without loss of coolant have been reviewed. As a result of this review, relocation of one monitor is being undertaken in order to insure that a minimum of two monitors will be in the direct path of radiations emanating from abnormal concentrations of fission products passing through the letdown heat exchanger. This monitor will remain in close proximity, but moved to the other side of the air cooler which it was intended to monitor. This move as well as testing of the monitors will be accomplished prior to plant start-up.

JUSTIFY ALLOWING THE SHIFT SUPERVISOR TO LEAVE THE CONTROL ROOM DURING AN ACCIDENT

During a condition in which the emergency plan is activated, the shift supervisor (SS) will be allowed to leave the control room for a brief period of time to make an evaluation of a problem that requires his attention and then immediately return to the control room. Justification for the SS to leave the control room is that if there is a problem elsewhere in the plant that needs his expertise, valuable information needed to make an evaluation may not be able to be explained in the detail needed using other communication techniques. An actual inspection may be required by the SS to make a quick evaluation based on his past experience and knowledge of the system as well as his overall knowledge of the present plant status during the accident condition.

Not allowing the SS to leave the control room to make an evaluation of a problem, a quick solution may be avoided causing more problems and delaying the stabilization of the plant.