June 24, 2002

Mr. William O'Connor, Jr.
Vice President
Nuclear Generation
Detroit Edison Company
6400 North Dixie Highway
Newport, MI 48166

SUBJECT: FERMI POWER PLANT
NRC INSPECTION REPORT 50-341/01-05(DRS) ADDENDUM

Dear Mr. O'Connor

On May 4, 2001, the NRC completed the first baseline safety system design and performance capability inspection at your Fermi Power Plant, Unit 2. During this inspection, a number of questions were asked by the NRC staff which contributed to the findings documented in the inspection report (issued June 5, 2001).

Because the questions asked by the staff were shared electronically with members of your staff, NRC has determined that they are required to be made publically available, in accordance with the requirements of NRC Manual Chapter 0620. Therefore, a copy of the questions are attached.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

We will gladly discuss any questions you have concerning this additional information.

Sincerely,

***/RA/***

John M. Jacobson, Chief
Mechanical Engineering Branch
Division of Reactor Safety

Docket No. 50-341
License No. NPF-43

Enclosure: Addendum to Inspection Report 50-341/01-05A(DRS)

See Attached Distribution

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Questions Asked During the Fermi
Safety System Design and Performance Capability Inspection

| RFI # | INSPECTOR | SUBJECT |
|---|---|---|
| 001 | O'Dwyer | Apparent discrepancy between TS, UFSAR & DBD. TS SR 3.5.1.8 required that when reactor pressure is 20 psig each LPCI pump must provide 10,000 gpm. However, Fig. 6.3-13 indicated that when RPV press is 20 psig, each pump should provide at least about 11, 025 gpm. UFSAR 6.3.2.2.4 stated that Fig. 6.3-13 (dated 4/99), R9) was the LPCI pump characteristic curve used in the Fermi 2 SAFER/GESTR LOCA analysis (dated 7/91) (the latest one that I have seen referenced). This is confirmed by DBD 4.1.1.1 requiring 11,025 gpm per LPCI pump when RV press 20 psid (over Drywell). This section referenced the latest SAFR/GESTR (7/91). Another section of UFSAR appears to require even more flow; however that analysis appears to be older and may just be out of date: in Fig. 6.3-14, sheet 2 (dated R8), Mode B-LPCI accident mode indicated that each LPCI pump will provide 12,930 gpm when reactor vessel pressure is 20 psig over drywell. |
| 002 | Lougheed | 23.205 section 5-1 discusses venting RHR - Instructions just say "vent". What is the acceptance criteria for showing the system has been properly vented? |
| 002a | Lougheed | Provide copy of CARD discussing venting |
| 003 | Lougheed | 23.205 step 5.1.3.a.1.b says to vent via E1100-F192C, however, drawing 6M721-2084 shows the vent valve with the # E1100-F192D. Which is correct? |
| 004 | Lougheed | The pump casing vent #s on 6M721-2084 do not match the numbers given in 23.205 steps 5.1.10 a & b |
| 005 | Lougheed | 23.205 precaution 3.18 discusses restrictions on closing the Div 2 E1100-F060B valve due to concerns about stem ejection. There is a similar valve on Div 1? Does this precaution also apply to it? |
| 006 | Scott | Provide a copy of drawing SD-2530-11 |
| 007 | Scott | Provide a copy of the most recent surveillance tests (TS 3.5.1.11) results that verify each RHR pump will automatically start on low reactor water level or high drywell pressure (LPCI Only). |
| 008 | Scott | Provide a copy of the most recent surveillance test results that verify MOV F048 A/B, F015 A/B, and F017 A/B receive an "Open Permissive Signal" in the event of a DBA. (LPCI) |
| 009 | Quirk | Why does E1150-F009 receive an isolation signal but E1150F608 does not? Provide the GE Design Spec Data Sheet (DSDS) for both F009 and F608. |
| 010 | Quirk | FSAR section 6.3.2.2.4.4 (6.3.2.2.4 is LPCI) indicates F007 opens upon sensing low flow when an RHR pump in the division is running, and closes when flow is above the low-flow setting. The P&Ids show F007 as being normally open. Which is correct? |
| 011 | Quirk | DBD 4.2.3.5 section 2.1 says E1150-F007A(B) are manually closed for containment isolation. If E1150-F007A(B) are normally open during plant power operation, why do they not receive an auto close signal? |

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|---|---|---|
| 012 | Quirk | Explain FSAR section 5.5.7.3.5.b - The RHR shutdown return line (to the RR system) has two valves outside containment, and valve is interlocked to at least a control permissive of low reactor pressure. I assume the valves are F611A(B) and F015A(B). Show me how this is incorporated in the circuitry (walk me through the schematic so I can better understand DECo schematic nomenclature. |
| 013 | Quirk | TS for LPCI lists some setpoints which I do not understand how they are used. Explain them. |
| 014 | Quirk | Provide the elementary wiring diagram of the Loop Select system. Walk me through the drawing. |
| 015 | Quirk | DBD section 2.2.1 addresses providing cooling water to the hydrogen recombiners as one of the safety functions. How is this done? |
| 016 | Quirk | Provide the GE Elementary Diagrams for RHR. Are the GE ED's maintained (updated)? |
| 017 | Lougheed | Any work requests associated with valves E1150-F003A or B over the last three years. |
| 018 | Sheldon | DWG 6I721-2105-11 S/D Reac Recirc Pump MG Set Testability Modification |
| 019 | Sheldon | TCTSR 28374-084 Installation of a Second Set of Form "B" Auxiliary Contacts to MCC Motor Starter Circuit |
| 020 | Lougheed | 23.205, 5.3.19: 1) what provides core cooling at this point? What directs the operator to this method? 2) Do steps 20 on reference back to step 18 (i.e., the F007 valve has not failed) or to step 19 (I.e., steps are taken only if step 19 is taken?) |
| 021 | O'Dwyer | Resolution and disposition of the following: GL-98-04, GL 97-04, IN 00-08, IN 98-40, IN 96-55, SIL 603 |
| 022 | Lougheed | 23.205, 6.2.10 & 6.3.2.m discuss the possibility of a water hammer in the head spray line. Please have someone discuss what causes the water hammer and what the effects are on the rest of the system |
| 023 | Gavula | UFSAR 5.5.7.5, "Inspection and Testing," states that heat exchanger tube leakage will be determined on a monthly basis by monitoring the service water return radiation levels. This is performed by CHS-AUX-12. What size tube leak can be detected using this procedure given normal contamination levels in the RHR system? |
| 024 | Gavula | UFSAR, 6.3.2.2.5, ECCS Discharge Line Fill System, states in several locations that the condensate water is supplied to the RHR system through a "pressure regulating valve." P&ID 2083 shows that valve PCV-F100 has been abandoned in place, and P&ID 2006 does not have any other pressure regulating valves. Either the FSAR is incorrect or the P&IDs don't show the pressure regulating valve. |
| 025 | Quirk | Valve E1150-F017B has a seal in the close direction. The RHR SOP which calls for throttling flow with this valve does not mention this feature of the valve. How does OPS control flow when the valve goes full closed when the close button is depressed? |
| 026 | Quirk | The RHR DBD HX Data Sheet section 4.2.2.1 notes the max allowable |

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|---|---|---|
| | | flow to avoid excessive flow induced vibration is 10,700 gpm. This is the same value used in the RHR SOP. How is instrument uncertainty taken into account? |
| 027 | Sheldon | TCTSR 29975 Dampening Adjustment Specification Requirement for E11N021A |
| 028 | Quirk | Request most recent performance Test of 24.204.03, Div 1 and 2 LPCI Simulation Auto Actuation Test & Valve Oper |
| 029 | Quirk | Based on CR walkdowns, flow indicators are in 500 gpm increments. Best can do is tell that flow is between 10,500 and 10,750. Because marks are close together, extremely difficult to read any more detail. If limit is really 10,700, then really limit due to instrumentation is 10,500. |
| 030 | Quirk | request copy of RHR system lesson plan LP-IC-331-1001 |
| 031 | Sheldon | What is the setpoint of B31-N611B? (Please provide documentation) |
| 032 | Gavula | DBD 4.1.2.16, states that the RHR system was designed for 30 suppression pool cooling "events" for 8 hours each event. This implies a total of 240 hours of suppression pool cooling over the 40 year life of the plant. According to plants records, from March 2000 through March 2001, the time in suppression pool cooling mode was 245 hours. How does this factor into the probability of a water hammer within the RHR system due to drain down, given the increased time spent in this mode? |
| 033 | Gavula | Given the information above, is the plant still within its design basis for use of suppression pool cooling? |
| 034 | Gavula | Part 1: Please provide the IST program evaluation sheet that deleted the IST acceptance criteria for pressurizing the suction piping to 100 psig in more than 30 seconds for pump discharge check valves E1100F031A-D. The criteria was changed from five minutes to 30 seconds in log 93-015. Part 2: If the check valve IST leakage criteria is now only for reverse pump rotation, then what assurance is there that the current monitoring of the check valves isn't deleted from the procedure? |
| 035 | Lougheed | Please provide calculations sizing orifice that limits heat exchanger flow to 10,700. |
| 036 | Sheldon | Please provide pages 27 - 37 of DC-5589. (I do not want the entire 3000+ page calc.) |
| 037 | Gavula | Please set up conference call to discuss risk significance of being in suppression pool cooling during normal operation. |
| 038 | Gavula | Followup to 32: Please explain the CDF numbers provided in TMLR 93-0037. What is the increase in CDF for a LOOP/LOCA (case 1)? |
| 039 | Gavula | More followup to 32: When calculating the 5.5% and 2.8%, what number was used in the denominator - total hours in year or total operating time? |
| 040 | Gavula | For relief valve F087 need the setpoint, flow capacity and last time tested or calibrated? |

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| 041 | Lougheed | When using either torus cooling or shutdown cooling, what instrumentation is used to determine the need for throttling the F048A/B valves closed? Is the valve position recorded anywhere (i.e., do the operators know whether the valve is full closed or not?) Do operators take into account instrument uncertainty? |
| 042 | Lougheed | ARP 2D86 on loss of keep fill requires operators to comply with TS 3.5.1 and 3.5.2. Does this mean that a loss of keep fill renders both divisions of RHR inoperable? |
| 043 | Gavula | Please provide copies of DC 3122 & 3123 |
| 044 | Scott | Is the training related to EDP-26039 modifying the start logic of RHR pump D and similar EDPs for other pumps given to operations? Does the simulator reflect this change? |
| 045 | Lougheed | 1) In review of surveillance procedure 24.204.01, step 5.1.8 opens the 28 valve, 5.1.9 starts the pump, 5.1.12 opens the 24 valve, 5.1.14 fully closes the 48 valve, AND 5.1.15 establishes a 10,000 gpm flowrate by throttling the 24 valve. This gives the impression that it is possible to get more than 10,000 gpm through the orificed torus cooling line.<br>2) 24.204.01 step 5.1.17 shows that is possible to get more than 500 gpm through the torus spray line (shows 767 achieved). This contradicts a statement in the lesson plan that flow through the torus spray line is limited to 500 gpm.<br>Based on these steps, it appears that it may be physically possible to put more than 10,700 through the heat exchanger. Therefore, question 26 needs to be reopened to look at the affects of instrument uncertainty. |
| 046 | Sheldon | Please provide copy of<br>GE Report NEDC-31336P-A<br>GE Instrument Setpoint Methodology |
| 047 | Quirk | Procedure 44.030.295 "ECCS DW Pressure ADS Actuation" :<br>1) Question on calibration of the pressure transmitter B21-N094A as noted in table 5 - The table calls for a test at 37.6% (1.88 psig) which corresponds to the TS Table 3.5.1.1-1 2.b Allowable Value (Av.), ($\leq$1.88 psig.) Typically the transmitter calibration check is at the nominal setpoint, not the Av. The nominal trip setpoint per Table TR 3.3.5-1 is $\leq$ 1.68 psig. Why is the 1.68 psig nominal setpoint value (33.6%) not used? Note: the actual trip unit B21-N694A cal in Table 3 uses 9.37 mA, which corresponds to 1.68 psig. Although this corresponds to information in Calc DC-4529 Vol 1 Rev F Appendix A, it is different from industry practice. Additionally, since the Av is less than or equal to 1.88 psig, the max as found and as left tolerance should be associated with 1.88 psig (2.504 volts), and not a band around 1.88 psig.<br>2) Calc DC-4529 Vol I Rev F Appendix A pg 11 provides the Acceptable Performance Tolerance (APT) and As Left Tolerance (ALT) for transmitter B21N094A - H. The APT is a band of 0.016 volts, and the ALT is a band of 0.006 volts. The corresponding calibration Procedure Table 5 used a non-conservative band of 0.020 volts. Justify this.(The calc revision predates the procedure revision) |

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| 048 | Quirk | Calc 4529 "Drywell Pressure Surveillance Procedure Validation", Rev F pg 10 -Why is the normal range of temperature 25 Degrees (Assume it is 69 - 104 Deg F) as shown on entry for tATEN, but for trip condition it is 90 - 134 Deg F? Should the trip range not include the bottom of normal band up to the top of the accident range? |
| 049 | Quirk | Calc DC-4557 "RHR Flow Surveillance Requirement" Revision F<br>1) pg 25 - do not understand the explanation for not including seismic acceleration for the square root converter E11-K600A(B). Just because the panel is seismically qualified typically does not mean the internals are seismically insulated, i.e., they will not be subject to seismic acceleration. I accept the statement for the attached downstream indicators not being required to operate during or after a DBE, but cannot understand the calc statement. If this statement in the calc is in fact flawed; has it been used where the consequences are not so benign?<br>2) Notes from my control room walkdown indicate the range of the recorder R608A is 0 - 30,000 GPM. Page 24 of the calc indicates the upper range is 28,000 gpm. Which is correct? If the walkdown info is correct, what are the consequences for the loop uncertainty?<br><br>3) The instrument data sheet for the Rosemont transmitter (pg 22) indicates the normal temperature range is 69 - 104 Deg F; this is consistent with Assumption 6. The calculation of temperature effect on pg 31 uses a temperature span of 90 - 104 Deg F. Why? What are the consequences of not using the full range? (My “back of the envelope” calc shows normal ATE would be 8.64 INWC rather than the 3.46 used in the calc, and trip ATE would be 48.13 INWC rather than the 42.95 in the calc.)<br>4) Pg 33 note 2 indicates besides the vendor specified accuracy, there are essentially no uncertainties associated with the square root extractor. Is this consistent with DECo experience, i.e., if there are any potential adjustments on the device, has there ever been a need to make any adjustments?<br>5) Pg 34, 37 (and potentially 38) - from my control room walkdown notes, the smallest graduation is 500 gpm. Justify why 125 gpm is the Observer Readability when the standard would be half the smallest graduation (250 gpm). What are the consequences if the smallest readability is 250 gpm? Why is readability not factored into the indicator error? |
| 050 | Scott | Provide the EQ Packages for the following equipment:<br>E11F074 SOV<br>E11N015A Flow Transmitter<br>E11N015B Flow Transmitter<br>E11N021A Flow Switch<br>E11N021B Flow Switch<br>E11N055D Pressure Transmitter<br>E11N056A Pressure Transmitter<br>E1102C002D Pump Motor<br>E115F015B Valve Operator<br>E115F048A Valve Operator. |

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| 051 | Quirk | Provide a title or description for TCEDP 30251 which has change paper against instrument uncertainty calcs DC-4523 and DC-4529. (Other change paper for these calcs were provided with the calcs) |
| 052 | Gavula | In procedure 24.204.01, the note to step 5.1.21 states that all four keepfill check valves are being checked in this step. If flow is initially observed in the F087 funnel drain and then stops after closing F208, this indicates that check valves F089 and F090 failed their IST acceptance criteria. At this point in the procedure, where would this IST failure be noted and evaluated for impact on the operability of the RHR system? |
| 053 | Gavula | Regarding procedure 24.204.01, step 5.1.21, if a condensate supply valve is not closed, why would the pressure, due to leakage from check valves F089 and F090, or F184 and F185, increase sufficiently in that portion of the system to lift the relief valve instead of just flowing back into other portions of the condensate system? |
| 054 | Lougheed | Please provide a copy of GE letter GE-NE-E12-00145-14 |
| 055 | Lougheed | Please provide me with the last completed version of 47.00.88. I was previously provided with a copy of the surveillance scheduling and tracking form for the performance of 47.00.88. However, no results were provided. |
| 056 | Lougheed | Followup to question 20: What restarts the RHR pumps? |
| 057 | Scott | Provide the calculation for the Division-1/2 ESF Battery “Design Cycle Test” (Ref: 42.309.03, Page 19). |
| 058 | Sheldon | Last Calibration of reactor recirc pump suction pressure instrument B31N611B and B31N111B |
| 059 | Quirk | Calculations DC-4529 and 4523 both have Appendix A “Calibration Specification” statements (section 1.f) “Periodic calibration of the transmitter is recommended but not mandatory. Simulated transmitter output can be used to calibrate/check the remainder of the channel components is desirable.” This does not make sense. What does it mean? If the front end of the loop is not in calibration, everything after that is also questionable. I concur a simulator can be used to perform checks and calibrations of downstream components, but the transmitter must have its calibration validated on a periodic basis. There is a similar but more confusing statement in calc 4540. |
| 060 | Gavula | Which is the correct pump curve, T3869 or TC 3905? |
| 061 | Lougheed | Based on the 4/25 conversation between Haupt, Harsley, Lougheed and Quirk, please provide the surveillance pump flow rates for each pump. Also provide the highest flow rates for each pump obtained during a surveillance over the last three years.<br>Please provide the highest flow rate through both the F027A and B valve experienced during a surveillance over the last three years. |
| 062 | Lougheed | Lesson plan IC-331-1001 page 9 states that the torus spray sparger limits flow to 500 gpm. This appears to be incorrect, based on surveillance test results. |

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| 063 | Quirk | Provide personnel to discuss RHR equipment protection from internal flooding. Has DECo reviewed the flooding analysis (e.g. calc DC-5426) to determine if the calculations for max flood level is adequate in regards to problems similar to those noted in Information Note 98-31 “Fire Protection Design Deficiencies and Common-mode Flooding of Emergency Core Cooling System Rooms at Washingotn Nuclear Plant Unit 2." Specifically, have assumptions about flood control doors and floor drains been validated? What fluid systems, such as RHR service water, fire protection, RBCCW, etc, could fail and impact RHR? Have these been reviewed to ensure they are not susceptible to damage from water hammer which could impact RHR? After these discussions I desire to be accompanied on a walkdown of areas associated with RHR equipment to check for protection against flooding. |
| 064 | Gavula | Please provide test results demonstrating that the maximum flow through the orificed lines, both the suppression pool cooling and shutdown cooling modes, is less than 10,700 gpm. |
| 065 | Gavula | Followup to RFI #23...1) Is the current amount of Cobalt 60 in the suppression pool representative of a “normal” amount and how sensitive is the amount to the duration of HPCI or RCIC testing?<br>2) If the previously provided leakage amount of 2000 total gallons is reasonable, what could this represent from a leak rate perspective from an RHR heat exchanger tube and would a leak rate of that size, from RHR into RHR Service Water be acceptable during a design basis accident? |
| 066 | Gavula | Followup to RFI #34: IST Program Evaluation Sheet 95-016 stated that there is no leakage criteria associated with the RHR pump discharge check valves.<br>1) What is the maximum leakage that could be detected using the current IST acceptance criteria of reverse pump rotation?<br><br>2) Given the above leakage, what magnitude of water hammer loads could occur during a LOP/LOCA event?<br>3) On a LOP, what actions are taken, prior to starting any RHR pump, to preclude a water hammer? |
| 067 | Quirk | Re: Calc DC-5110 Where is room 105? Does it contain any RHR related equipment? (Section Titled “Main Steam Line Break."<br>Also, the copy provided is missing pages 8, 11, and 13 of 120. I do not need them, but DECo may want to verify they can be retrieved.) |
| 068 | Lougheed | Followup to RFI#053: the GE letter is referenced in the operability determination for CARD 98-18661 |
| 069 | Quirk | Followup to RFI #047: the response to question 2 indicates the current practice is to notify the surveillance procedure group via NDI when the calcs are revised. Was this the process when calc DC-4529 was last revised? If it was the process, why was the Surveillance Procedure not updated? |
| 070 | Lougheed | Followup to RFI#061: the operator lesson plan ST-OP-315-0041-001 on page 10 also states that the torus spray flow is limited to 500 gpm due to nozzle sizing. This appears incorrect, based on surveillance test results. |

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|---|---|---|
| 071 | Lougheed | CARD 01-13989 initial operability determination item 2 states that the RHR system is considered operable because {potentially} a high pressure alarm would be received or upsets observed in the compressed air head tank. Questions: the last sentence on page 1 implies that relief valve is unlikely to lift because of the volume of piping - however, the setpoint for the high pressure alarm is 120 psig compared to the relief valve setpoint of 125 ± 2%. 1) If there is there is so much piping that the relief valve might not lift how can you justify operability based on not getting an alarm at basically the same pressure? 2) Also, who would have observed upsets in the compressed air tank - and how would the upsets have been observed? Was anybody watching for this? |
| 072 | O'Dwyer | Please provide the analysis demonstrating that air ingestion into the LPCI pumps from blowdown and chugging due to a Large Break LOCA (LBLOCA) (with no LOOP) will not cause either cavitation sufficient to cause catastrophic failure or air binding of the pump (since the pumps have significant areas higher than the highest elevation of the outlet piping). |
| 073 | O'Dwyer | Please provide a copy of Supplemental Test #19 of RHR Preoperational Test PRET.E1100.001. |
| 074 | Gavula | Followup to RFI # 060...pump curve T-3869 shows an NPSH requirement of 9 feet @ 10,000 gpm. TC-3905 shows an NPSH requirement of 13 feet @ 10,000 gpm. Explain why there is a difference between these pumps. |
| 075 | Gavula | In Calculation DC-0592, "RHR System Runout Assessment," shouldn't the pressure drop across the suction strainer be minimized to maximize the system flow? Also, should a flow path through the RHR heat exchanger be included in the model in order to maximize system flow? If so, what is the consequence to the flow? |
| 076 | Quirk | Re: procedure 44.030.255 "ECCS - Reactor Water Level (Levels 1, 2, and 8) , Division 1, Channel A Calibration" revision 41, completed 4-6-00, table 13 (pg 20) - Why are tolerances for the check at 44.7% (-151.20 INWC) and 99.5%(-69.8 INWC) different by i millivolt from those in calc 4523 Appendix A pg 9 when all the other values match? Why does the cal procedure not include Acceptable Performance Tolerances (APT) , and As Left Tolerances (ALT)? Similar question for B21-N692A for APT and Leave Alone Tolerances (LAT) (44.030.255 pg 7 and Calc DC-4523 appendix A pg 10 of 26? |
| 077 | O'Dwyer | Please provide someone to walkdown the RHR system (especially the pumps). |
| 078 | O'Dwyer | In reference to question 73, please have someone discuss step 6.11 and 6.12 of the preop test. calculating tdh w/ 2 rhr pumps injecting to core - wish to discuss number used for static head and how developed tdh |
| 079 | Sheldon | CARD 00-17616 |
| 080 | Sheldon | Are technicians expected to write a CARD if an instrument is found out of tolerance? |

| RFI # | INSPECTOR | SUBJECT |
|---|---|---|
| 081 | Lougheed | When setting flow for pump performance testing in surveillance 24.204.01 and .06, what position is the F024A(B) valve in (i.e., full open or throttled)? |
| 082 | Quirk | Calc DC5707 section P for channel 6 indicates that the Process Measurement Accuracy and Primary Element Accuracy are not required. Justify this, particularly the PEA error. How does this effect 23.208 including caution 5.2.2.9? |
| 083 | Gavula | followup to 038 - cdf for loop with spc assuming rhr pumps start on high drywell pressure. |