

Lake, Louis

From: Lake, Louis
Sent: Tuesday, November 24, 2009 9:24 AM
To: Carrion, Robert
Subject: FW: Refute 8.5 for Review
Attachments: FM 8.5.ppt; Vacuum Calculation.doc; Item 108 - Purge Fan Event.pdf

CP

From: Williams, Charles R. [mailto:Charles.Williams@pgnmail.com]
Sent: Tuesday, November 24, 2009 7:19 AM
To: Lake, Louis; Thomas, George; nausdj@ornl.gov
Subject: Refute 8.5 for Review

8.5 Containment depressurization due to inadequate purging operation

Preliminary

May identify additional perspective on this issue as RCA related efforts proceeds

<p>Description: It was reported by a former CR3 operator (Dave Jones) that an event occurred in the late 1980's or early 1990's during which a purge exhaust fan was operating with the inlet purge valve closed. This resulted in a vacuum in the containment building.</p>	
<p>Data to be Collected and Analyzed: Review event data, equipment information, and conduct personnel interviews if possible.</p> <ol style="list-style-type: none"> 1. Dave Jones (former CR3 operator) interview documented November 10, 2009 placed the event to the late 1980s to early 1990's. (Exhibit 1) 2. No NCR to document the event has been found. CR3 self-evaluation unit has exhausted all databases in their document search. Estimate maximum vacuum achievable with purge fan operation. (Exhibit 1, pg 1) 3. Purge fan vender manuals: VTMA 231 (Exhibit 2, pgs 2-5) 4. Make/model of the purge fan: Joy Manufacturing Model 36-26.5-1770 axial vane fan. (Exhibit 1, pgs 2-5) 5. Review containment design bases, FSAR Section 5. (Exhibit 3) 	
<p>Verified Refuting Evidence: A calculation of a postulated worse-case vacuum generated by the purge fan demonstrated that a vacuum of 1 psi is less than the design bases for containment .</p> <p>Reviewed by Dr. Patrick Berbon, 352-795-6486 ext. 1030 - PII CR3 Team Office</p>	<p>Verified Supporting Evidence:</p>

1 Ray

OPER FILE

FLORIDA POWER CORPORATION

P.O. #PR3-2742

CYRSTAL RIVER PLANT UNIT #3

RED LEVEL, FLORIDA

JOY MANUFACTURING COMPANY SERIES 2000 FANS

MARK NO.

DUTY

AHF-26A	62,500 CFM @ .90" Pt
AHF-26B	62,500 CFM @ .90" Pt
AHF-26C	62,500 CFM @ .90" Pt
AHF-27A	66,000 CFM @ 1.1" Pt
AHF-27B	66,000 CFM @ 1.1" Pt
AHF-27C	66,000 CFM @ 1.1" Pt
AHF-25A	50,000 CFM @ 1.1" Pt
AHF-25B	43,750 CFM @ 1.1" Pt
AHF-25C	43,750 CFM @ 1.1" Pt
AHF-22A	31,800 CFM @ 1.53" Pt
AHF-22B	31,800 CFM @ 1.53" Pt
AHF-22C	31,800 CFM @ 1.53" Pt
AHF-22D	31,800 CFM @ 1.53" Pt
AHF-23A	12,055 CFM @ 1.56" Pt
AHF-23B	12,055 CFM @ 1.56" Pt
AHF-7A	25,000 CFM @ 10" Pt
AHF-7B	25,000 CFM @ 10" Pt
AHF-11A	48,500 CFM @ 4.3" Pt
AHF-11B	48,500 CFM @ 4.3" Pt
AHF-14A	78,340 CFM @ 11" Pt
AHF-14B	78,340 CFM @ 11" Pt
AHF-14C	78,340 CFM @ 11" Pt
AHF-14D	78,340 CFM @ 11" Pt
AHF-19A	42,355 CFM @ 2.0" Pt
AHF-19B	42,355 CFM @ 2.0" Pt
AHF-3A	45,000 CFM @ 2.73" Pt
AHF-3B	45,000 CFM @ 2.73" Pt
AHF-4A	62,000 CFM @ 3.2" Pt
AHF-4B	62,000 CFM @ 3.2" Pt
AHF-6A	25,000 CFM @ 4.7" Pt
AHF-6B	25,000 CFM @ 4.7" Pt

Controlled
Mfg. Manual

REVISION 00

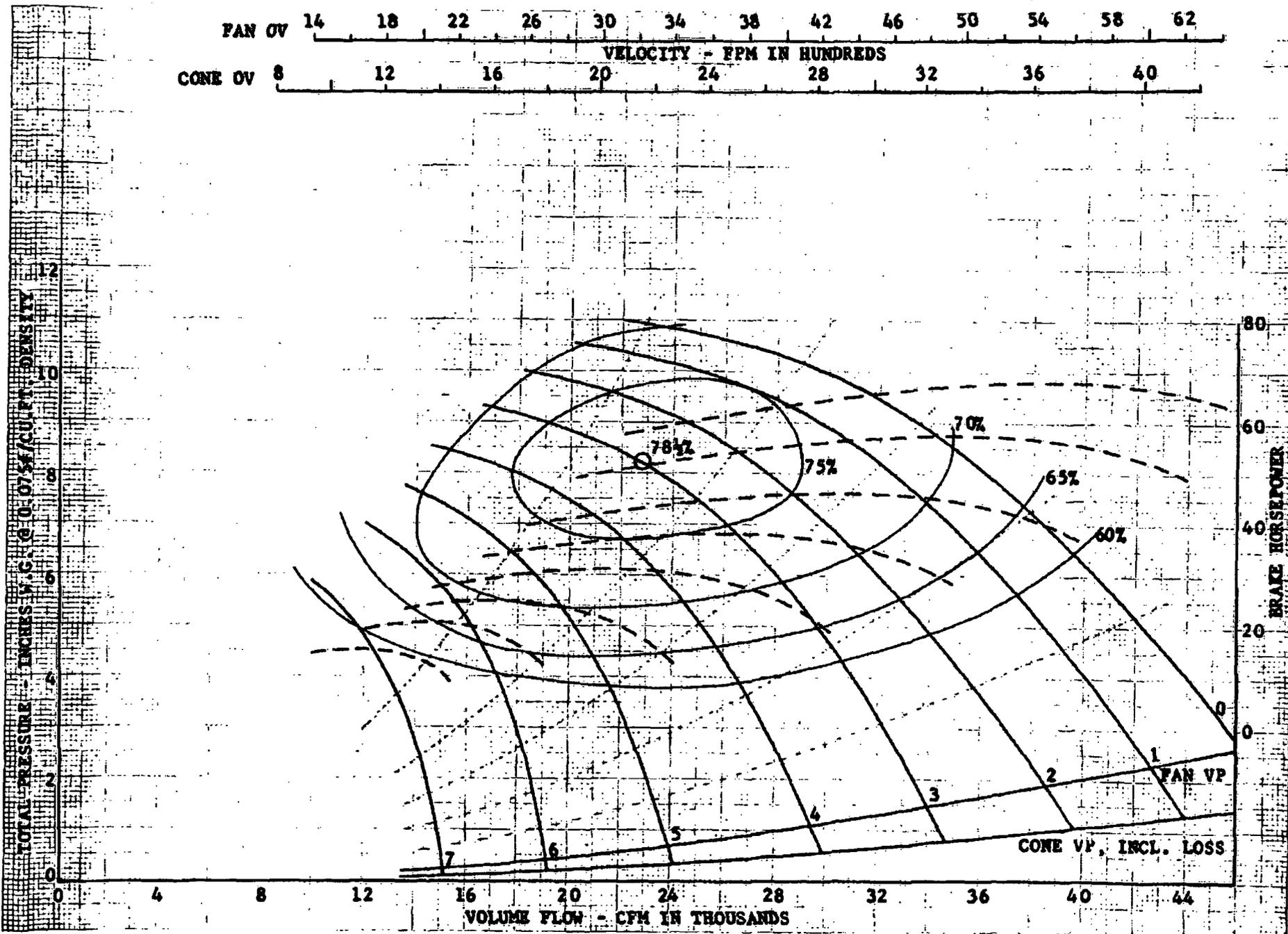
**Index of Joy Fan, Serial Number to Plant Tag Number and Fan Blade Setting
Series 2000 Fans**

<u>Tag Number</u>	<u>Model Number</u>	<u>Blade Settings</u>	<u>Reference</u>
AHF-26A	60-26.5-870	3.5	Factory
AHF-26B	60-26.5-870	3.5	Factory
AHF-26C	60-26.5-870	3.5	Factory
AHF-27A	60-26.5-870	3	Factory
AHF-27B	60-26.5-870	3	Factory
AHF-27C	60-26.5-870	3	Factory
AHF-25A	54-26.5-870	3.5	Factory
AHF-25B	54-26.5-870	4	Factory
AHF-25C	54-26.5-870	4	Factory
AHF-22A	48-26.5-1170	*	WR 350697/REA 97-2281
AHF-22B	48-26.5-1170	*	WR 350697/REA 97-2281
AHF-22C	48-26.5-1170	*	REA 97-2281
AHF-22D	48-26.5-1170	*	REA 97-2281
AHF-23A	34-26.5-1170	4.5	Factory
AHF-23B	34-26.5-1170	4.5	Factory
AHF-7A	36-26.5-1770	1	Factory
AHF-7B	36-26.5-1770	1	Factory
AHF-11A	48-26.5-1770	5.5	Factory
AHF-11B	48-26.5-1770	5.5	Factory
AHF-14A	54-30-1770	3	WR 345308
AHF-14B	54-30-1770	3	WR 338716
AHF-14C	54-30-1770	3	WR 345309
AHF-14D	54-30-1770	3	WR 345456
AHF-19A	54-26.5-870	2.5 **	WR 360843/NCR 42230
AHF-19B	54-26.5-870	2.5 **	WR 360844/NCR 42230
AHF-3A	48-26.5-1170	NA	Not Adjustable
AHF-3B	48-26.5-1170	NA	Not Adjustable
AHF-4A	60-26.5-1170	NA	Not Adjustable
AHF-4B	60-26.5-1170	NA	Not Adjustable
AHF-6A	38-26.5-1770	NA	Not Adjustable
AHF-6B	38-26.5-1770	NA	Not Adjustable

* AHF-22A/B/C/D fans set at blade angle of 5.5 degrees per REA 97-2281.

** AHF-19A replaced under WR 360843. NCR 42230 identified the blade pitch at 2.5 and determined 2.5 to be the proper setting. AHF-19B verified at 2.5 setting under WR 360844.

NOISE



APRIL 15, 1968
C-5102

JOY SERIES 2000 AXIVANE FAN
MODEL 36-26-1770

1 Page

Data Request #108 – Estimated vacuum achievable with purge fan

It was reported by Dave Jones (former CR3 operator) that an event occurred in the late 1980's or early 1990's during which a purge exhaust fan was operating with the inlet purge valve closed. This resulted in a vacuum in the containment building. The exact date of the event could not be determined, so retrieving the RB pressure strip chart to determine the resulting RB pressure is not practical.

An alternate method of determining the resulting RB pressure is to estimate a "worst case" vacuum based on system performance. The CR3 purge fans (AHF-7A/7B) are Joy Manufacturing model 36-26.5-1770 axial vane fans. The fan curve for these units are contained in vendor manual VTMA 231 (curve attached). The design point for the fans is 25000 cfm @ 10" wg with a blade setting of 1. The fans are connected to the containment building through a series of ductwork, filters, and dampers, and exhaust to the atmosphere.

If the fan curve is extrapolated to dead head (no flow) conditions, the maximum total pressure developed by the fan is approximately 12" wg. If the pressure loss in the ventilation system is conservatively neglected, the maximum vacuum would be equal to the atmospheric pressure minus the total pressure imparted by the fan. Since 12" wg is equal to approximately 0.433 psi, the RB vacuum would have been less than 0.5 psi. If the maximum total pressure of the fan is doubled to account for uncertainty of the extrapolation method, the vacuum would have been less than 1 psi.

Craig Miller