

AR 00659060 Report

Aff Fac:	LaSalle	AR Type:	CR	Status:	COMPLETE
Aff Unit:	01	Owed To:	A8650ENCAP	Due Date:	09/28/2007
Aff System:	FW			Event Date:	08/09/2007
CR Level/Class:	4/D			Disc Date:	08/09/2007
How Discovered:	H02			Orig Date:	08/09/2007
WR/PIMS AR:		Equip Tag:	1C34-N001A		

Action Request Details

Subject: TRENDING ON UNIT 1 FW FLOW RATIO

Description: Originator: JOSEPH J TOKARZ Supv Contacted: Mark Murskyj

Condition Description:

This IR describes an increasing trend of the flow ratio of Unit 1 feedpump discharge flow to corrected feedwater header flow.

The pump discharge flow is measured using an external Leading Edge Flowmeter (LEFM) on the discharge of the 1A and 1B TDRFP. The corrected FW header flow is the FW header venturi flow multiplied by a FW venturi correction factor and are computer points C188 and C189.

LLP-2007-001 'Monitoring Feedwater Flow Correction Factor' trends the ratio of flow to corrected FW header flow ($LEFM/(C188+C189)$) and requires an IR to be written when the flow ratio exceeds 0.999.

The current one-hour average is 0.9984.

Per EC 364168 'Methodology to Determine BEPM' and LLP-2007-001, the primary monitoring tool is the Best Estimate Power Monitor (BEPM), which shows good agreement with power and is not challenging the 0.998 BEPM limit.

The flow ratio is secondary parameter.

The flow ratio has been increasing since February 2007: Feb 0.996, May 0.9965 Jun 0.9975 and Aug 0.9984. A ratio greater than 0.999 indicates a potential defouling of the FW header venturis.

Changes in zinc injection and/or MDRFP warming flow could also contribute to the changes in the flow ratio.

From February to August, the range of zinc flow was 37.5 to 51 gpm. Recently, zinc was taken Out of Service. This decreased zinc flow from 47.5 to 0 gpm and caused the flow ratio to change from 0.9984 to 0.9964.

The MDRFP warming flow is controlled by a fixed orifice. The warming flow is not measured. The MDRFP has not been OOS, when warming would have been isolated, during this time.

I discussed the possibility of the flow ratio change due to LEFM drifting

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with Ryan Hannas of Cameron (Formerly Caldon, Inc.) at (724) 273-9300. Ryan reviewed the LEFM logs and verified the LEFM is working correctly.

Based on above, there is no current concerns with feedwater flow venturi defouling.

This IR shows potential adverse trend with flow ratio and is being issued as a proactive measure to investigate the issue.

Recommend a 30 day ACIT AT to Design Engineering to review Best Estimate Power Monitor and FW Ratio trends and review correction factor value.

Recommend a 30 day ACIT review AT to Plant Engineering to review secondary parameter (1st stage pressure and Main Steam Line Flow) trend data with Cameron.

Immediate actions taken:

Reviewed trend data, discussed this with vendor and captured data in IR

Recommended Actions:

Recommend a 30 day ACIT AT to Design Engineering to review Best Estimate Power Monitor and FW Ratio trends and review correction factor value.

Recommend a 30 day ACIT review AT to Plant Engineering to review secondary parameter (1st stage pressure and Main Steam Line Flow) trend data with Cameron.

What activities, processes, or procedures were involved?

Trending

Why did the condition happen?

Potential changes in venturi defouling, LEFM flow, Venturi flow, MDRPF warming flow, zinc flow and LEFM drift.

What are the consequences?

none, flow ratio is a secondary parameter.

Were any procedural requirements impacted?

None. Current flow ratio is 0.9984. LLP-2007-001 requires IR written if flow ratio exceeds 0.999

Were there any adverse physical conditions?

none

List of knowledgeable individuals:

M.Murskyj
J.Rommel
J.Bashor
K.Kehring
S.Latimer

Repeat or similar condition?

No

Operable Basis:

Based on trends of BEPM, MSL flows and 1st stage pressure, there is no evidence to suggest that the FW flow venturis are de-fouling.

Reportable Basis:

Reviewed by: GUY V FORD JR 08/09/2007 18:59:28 CDT

Reviewer Comments:

No additional comments.

SOC Reviewed by: JOHN J WASHKO 08/15/2007 07:54:58 CDT

SOC Comments:

Close to ATs generated to:

Design Engineering to review Best Estimate Power Monitor and FW Ratio trends and review correction factor value.

Plant Engineering to review secondary parameter (1st stage pressure and Main Steam Line Flow) trend data with Cameron. (Bellettini)

MRC (08/20/07) requested a Dept Eval to Engineering. The existing ATs will be cancelled and the Eval with request any further actions upon completion of the evaluation. Department review performed by: NANCY BONOMO 08/31/2007 14:05:21 CDT

Evaluation Comments:

Condition/Problem Statement:

This IR describes an increasing trend of the flow ratio of Unit 1 feedpump discharge flow to corrected feedwater header flow.

LLP-2007-001 'Monitoring Feedwater Flow Correction Factor' trends the ratio of the Cameron (Caldon) Leading Edge Flowmeter (LEFM) flow to corrected FW header flow (LEFM/(C188+C189)) and requires an IR to be written when the flow ratio exceeds 0.999. The current one-hour average is 0.9984.

The flow ratio has been increasing since February 2007:

Feb 0.996

May 0.9965

Jun 0.9975

Aug 0.9984

A ratio greater than 0.999 indicates a potential defouling of the FW header venturis.

Statement of Cause:

Based upon plant trending and discussions with Cameron, plant data was sent to Cameron for further evaluation. The potential cause of the approximately 0.15 to 0.2% shift in ratio is discussed in Cameron Engineering Report ER-619 Rev 0, 'Review of LaSalle Feedwater Flow Measurement data 6 months after Installation of an LEFM External Feedwater Flow Measurement System'.

Engineering has reviewed Cameron's report and concurs with the following conclusions:

The data and subsequent analysis suggests that the most probable cause of the change seen in the LEFM/FW nozzle ratio is a slight defouling of the FW nozzles; accounting for a slight shift in nozzle calibration of approximately -0.1% and a simultaneous change in axial velocity profile occurring at the LEFM installation location, accounting for a slight shift in LEFM calibration of approximately +0.1%

Independent indication of Feedpump discharge nozzles and the average of the steam flow and 1st stage pressure indication (BEPM) are consistent with this finding, within +/- 0.1%

These conclusions are largely inferred because it is beyond the ability of any of these instruments to detect these differences to this precision. It is clear; however, that changes are occurring. It is equally clear that the changes are well within the bounds that have been assigned for any of the possible errors in the uncertainty analysis and procedures that are governing the operation of the plant.

No action is recommended or required at this time, but an action may be required prior to the outage to reassess this analysis if the trend in the LEFM/Fw nozzle ratio continues such that the setpoint of 0.999 is triggered. If there is no change to the overall conclusions of this analysis; however, the likely outcome would be to re-calibrate the FW nozzles to the average of LEFM and FW nozzles and reestablish an appropriate setpoint.

Extent of Condition:

This is applicable to Unit 1 only.

This appears to be limited to the FW header flow venturis and LEFM. FW pump discharge flow and Best Estimate Power Monitor (BEPM) have remained fairly constant. Being within the margin of uncertainty, there is no risk to operations.

System Engineering is currently reviewing the trends weekly in accordance with LLP-2007-001. Should the ratio increase, another IR will be written to further evaluate the cause of the ratio change and the potential need to revise the correction factor applied to C188 and C189.

QREC 00659060-04 will transmit Cameron Engineering Report ER-619 Rev 0, 'Review of LaSalle Feedwater Flow Measurement data 6 months after Installation of an LEFM External Feedwater Flow Measurement System' to records.

Evaluation of any SOC Comments:
None

MRC Reviewed by: JAMES A SCHUSTER 09/05/2007 09:53:04 CDT
MRC Comments:
MRC (9/5/07) Evaluation approved.

Trend Codes

TC1	TC2	TC3	Proc	Org	Rank
EQM	MM	N	*	*	P

Assignments

Assign #:	<u>01</u>	Assigned To:		Status:	COMPLETE
Aff Fac:	LaSalle	Prim Grp:	ACAPALL	Due Date:	09/06/2007
Assign Type:	TRKG	Sec Grp:		Orig Due Date:	08/14/2007
Priority:					
Schedule Ref:					
Unit Condition:					
Subject/Description:	TRENDING ON UNIT 1 FW FLOW RATIO				

Assign #:	<u>02</u>	Assigned To:	DRDQ4	Status:	CANCELED
Aff Fac:	LaSalle	Prim Grp:	A8652NESD	Due Date:	09/07/2007
Assign Type:	ACIT	Sec Grp:		Orig Due Date:	09/07/2007

Priority:

Schedule Ref: NONE

Unit Condition:

Subject/Description: to review Best Estimate Power Monitor and FW Ratio trends and review correction factor value.

Assign #: 03 Assigned To: LASJT Status: CANCELED

Aff Fac: LaSalle Prim Grp: A8630NESSC Due Date: 09/07/2007

Assign Type: ACIT Sec Grp: Orig Due Date: 09/07/2007

Priority:

Schedule Ref:

Unit Condition:

Subject/Description: to review secondary parameter (1st stage pressure and Main Steam Line Flow) trend data with Cameron.

Assign #: 04 Assigned To: LASJT Status: COMPLETE

Aff Fac: LaSalle Prim Grp: A8630NESSC Due Date: 09/21/2007

Assign Type: QREC Sec Grp: Orig Due Date: 09/06/2007

Priority:

Schedule Ref:

Unit Condition:

Subject/Description: Transfer of Caldon Engr Report ER-619 Rev 0 to records