AR 00091771 Report

Aff Fac:	Byron	**AR Type:**	CR	**Status:**	APPROVED
Aff Unit:	01	**Owed To:**	A8850CAP	**Due Date:**	12/31/2011
Aff System:	FW			**Event Date:**	01/17/2002
CR Level/Class:	3/B			**Disc Date:**	01/17/2002
How Discovered:	H02			**Orig Date:**	01/22/2002

Action Request Details

Subject: Unexplained differences between Byron and Braidwood

Description:

BYRON EXELON NUCLEAR CONDITION REPORT
CR 91771
Required Information

Condition Description:
A review of plant data indicates there is an unexplained difference between Byron Unit 1 and Braidwood Unit 1. Numerous plant indications that are a function of mass flow rate through the secondary plant are indicating 1.5-2.5% higher on Byron Unit 1 than Braidwood Unit 1 and many are greater than the guaranteed thermal kit. Not one indication reviewed by the Thermal Performance Engineer is higher on Braidwood Unit 1 than Byron Unit 1. This suggests there could be a bias with one of the Feedwater flow measurement systems at one of the sites.

SUPPORTING DATA
1. System Parameters
When the Byron Unit 1 data is extrapolated to 100% rated thermal power under normal plant alignment, the following station parameters are projected to be higher on Byron unit 1 than Braidwood unit 1 :
Condensate Boost Pump flow, Heater drain pump flow, main feedwater pump flow, sum of condensate boost and heater drain pump flow, high pressure turbine impulse pressure, all high pressure turbine extraction steam pressures, final FW temperature, RCS delta Ts, electrical MWe, and AMAG correction factor. The above system parameters will on average be 2.1% higher on Byron unit 1 than on Braidwood unit 1.

2. High Pressure Turbine Flow Margin
Following the on line power uprate implementation on Byron 1, the unit was unable to achieve 100% rated thermal power because the main turbine governor valves went full open (CR B2001-02214). The unit was only able to achieve 97.9% on a routine basis. Braidwood Unit 1 was able to achieve 100% rated thermal power following their final power uprate implementation (CR 80251). During this time Braidwood had a main steam pressure 6 psi greater than Byron. Combining the main steam pressure and achievable reactor power differences, the Byron Unit 1 HP turbine has a 1.5% lower flow passing capability than the Braidwood Unit 1 HP turbine. Both of these HP turbines were manufactured to the same specifications and installed during the most recent refueling outages. The Byron Unit 1 HP turbine does not pass the required flow under design conditions. (In fact neither the Byron unit 1 nor the Byron unit 2 can pass the required flow under design conditions)

3. Power Uprate MWe Verification Tests
The post power uprate MWe verification test for Byron Unit 1 yielded a corrected capability of 1257 MWe at turbine design conditions. The post power uprate MWe verification test for Braidwood Unit 1 yielded a corrected unit capability of 1235 MWe (This is not yet official) at

turbine design conditions. The difference in MWe production is 22 MWe or 1.8% of the design value of 1242 MWe.

4. Siemens Evaluations
Although provided in an informal manner, Siemens has questioned Byron turbine performance and operating characteristics following the power uprate, suggesting we evaluate our AMAG implementation. On one occasion Siemens made a verbal comment about the ability of the Byron units to exceed their MAX Calculated choke point vacuum heat balance Mwe limits. They stated that it was not expected that a unit would be able to exceed that heat balance Mwe limit.

Although reasonable engineering principles (instrument accuracy, instrument drift, calibration standards, manufacturing tolerances, and equipment performance) can explain the individual parameter differences between operating units, the fact that there are diverse indications (pressure, temperature, flow, MWe, cross sectional area) that are offset approximately the same amount in the same direction, suggest there is a bias that is affecting the units.

Byron has performed a prior review of station data prior to implementing AMAG in May of 2000. The result of this review was that the secondary plant indications did not refute the FW flow measurement by AMAG. Since this time Byron and Braidwood have replaced HP turbines and preformed a power uprate. This has led to additional information being provided to the site (items 2-4 above) and has prompted the generation of this CR. The reviews performed by the thermal engineer are consistent with the information provided in SER 11-94 and the recently issued OE12686 from Beaver Valley 2.

A prior review indicated this same issue may apply to Byron 2 and Braidwood 2 (Byron unit 2 parameters were higher than Braidwood unit 2 parameters).

It is recommended that an independent review be performed by non-EXELON personnel to evaluate station data and determine the root cause of the differences between Byron and Braidwood station. Although this review should be independent, Byron and Braidwood should work hand in hand to resolve this issue. Both sites have expended a significant amount of resources over the past 2.5 years trying to rectify the differences between sites.

How Discovered:
Post Power Uprate Engineering data review

Immediate Actions Taken:
Contacted station management and initiated CR

Associated WO, WR, ECR, PCR, etc.:
None at this time

Originator's Name:
David Eder

Optional Additional Information

Why did the condition happen?
Unknown

What are the consequences?

Any procedural requirements impacted?
None

Identify any adverse physical conditions:
None identified

Identify who was notified:
Tom Roberts, Steve Kuczynski, Rich Lopriore

List knowledgeable individuals:
Tom Roberts, Joe Williams (prior data review).

Is this a repeat or similar condition?
This appears to be a continuation of the issue identified in Byron Station letter 99-0109.

(For use by MA sites only)
Additional equipment related information:

Supervision Comments Template

Problem/Condition Statement:

Extent of Condition:

Why It Happened:

Recommended Solution and Basis for Recommended Evaluation Class:

Action Taken or To Be Taken:

Supervisor's Name:

Assignments

Assign #:	01	**Assigned To:**	BYRZE	**Status:**	COMPLETE
Aff Fac:	Byron	**Prim Grp:**	A8830NESTT	**Due Date:**	09/13/2002
Assign Type:	ACE	**Sec Grp:**		**Orig Date:**	03/15/2002
Priority:					
Schedule Ref:					
Unit Condition:					
Subject/Description:	Document the results of the independent review and any co				

Assign #:	02	**Assigned To:**	NETRX	**Status:**	COMPLETE
Aff Fac:	Byron	**Prim Grp:**	A8830EM	**Due Date:**	02/28/2002
Assign Type:	ACIT	**Sec Grp:**		**Orig Date:**	02/28/2002
Priority:					
Schedule Ref:					
Unit Condition:					
Subject/Description:	Solicit and have performed an independent review of the B				

Assign #:	03	**Assigned To:**	BYRZE	**Status:**	COMPLETE
Aff Fac:	Byron	**Prim Grp:**	A8830NESTT	**Due Date:**	05/14/2002
Assign Type:	MRC	**Sec Grp:**		**Orig Date:**	03/22/2002
Priority:					

Schedule Ref:
Unit Condition:
Subject/Description: Present evaluation. Document quorum present for review.

Assign #:	04	**Assigned To:**		**Status:**	ACC/PRI
Aff Fac:	Byron	**Prim Grp:**	A8850CAP	**Due Date:**	09/20/2002
Assign Type:	ACIT	**Sec Grp:**		**Orig Date:**	03/28/2002

Priority:
Schedule Ref:
Unit Condition:
Subject/Description: Update trend codes and notify CAP Reg Assurance Clerk to

Assign #:	05	**Assigned To:**	BYRZE	**Status:**	ACC/PRI
Aff Fac:	Byron	**Prim Grp:**	A8830NESTT	**Due Date:**	09/20/2002
Assign Type:	PORC	**Sec Grp:**		**Orig Date:**	05/30/2002

Priority:
Schedule Ref:
Unit Condition:
Subject/Description: Take ACE on Unexplained Dif Between Byr & Bwd to PORC

Assign #:	06	**Assigned To:**	BYRZE	**Status:**	ACC/PRI
Aff Fac:	Byron	**Prim Grp:**	A8830NESTT	**Due Date:**	09/20/2002
Assign Type:	MRC	**Sec Grp:**		**Orig Date:**	06/03/2002

Priority:
Schedule Ref:
Unit Condition:
Subject/Description: MRC review of ACE *