

From: Jones, Alan D.
Sent: Monday, February 18, 2008 9:12 PM
To: Ellis, H. Gene
Cc: Tran, Paul; 'Wendy Bley
Shirley Williamson @ PBP
Subject: RE: FW: Requirements For Narrows Generating Units 2 & 4

Yes, very close.
Alan

From: Ellis, H. Gene
Sent: Monday, February 18, 2008 11:08 AM
To: Jones, Alan D.
Cc: Tran, Paul; 'Wendy Bley; Shirley Williamson; Ellis, H. Gene
Subject: RE: FW: Requirements For Narrows Generating Units 2 & 4

Alan,

Quick question: During the 35-40% of the time we are at 40% gate or less, is the load typically at that 1-2 MW level or does it vary? In other words, if you operate below 40% gate, is it always at the 1-2 MW level.

Gene

From: Jones, Alan D.
Sent: Friday, February 15, 2008 11:29 AM
To: Ellis, H. Gene
Cc: Tran, Paul; Wendy Bley
Subject: RE: FW: Requirements For Narrows Generating Units 2 & 4

It's quite often that we run below 40% on one unit at Narrows. Where there is no energy schedules we are usually running one of the units to balance control area load. The unit will have about 1-2 MW on it and sometimes no-load. We usually use 4 because it tracks load on AGC better when running at this low setting. Typically, there is usually a unit on-line during off-peak hours and if not on-line during on-peak are usually in spinning reserve at zero load.

A good estimate would be about 35-40% of the time one unit is at 40% gate or less.

Alan

From: Ellis, H. Gene
Sent: Friday, February 15, 2008 8:31 AM
To: Jones, Alan D.
Cc: Tran, Paul; Wendy Bley; Ellis, H. Gene
Subject: FW: FW: Requirements For Narrows Generating Units 2 & 4

Alan,

Can you give us some idea of how often we would be at 40% gate or less?

Thanks,

Gene

From: BLEYLVA
Sent: Friday, February 15, 2008 7:36 AM
To: Ellis, H. Gene
Subject: Re: FW: Requirements For Narrows Generating Units 2 & 4

Gene, This is a very interesting report. It contains useful detailed information on how the aeration system on Unit 4 is designed to operate, and under what conditions (gate opening, tailwater elevation, etc.) it operates best. I see no issues from an RSA/License compliance standpoint. As far as the State and FERC are concerned, Unit 4 work was completed long ago. However, I have one suggestion and one thought: First, I recommend that APGI keep all reports such as this together in a DO Enhancement compliance file so that if there are ever any questions from DWQ about the aeration technology that APGI has installed, and how it is designed to operate and what limitations it has, they can be easily answered. We may even want to consider including such reports on technology in our annual reports (as they become available). Second, it is obvious from this report that there are "options" for how the aeration technology on Unit 4 can be run. The compliance requirement for Unit 4 (and Unit 2) is that aeration valves are "on" whenever the units are operating. So, I believe there is flexibility in the compliance requirement for APGI to determine what constitutes the aeration system being "on". In other words, APGI is free to use either the VB or peripheral systems alone or in combination. Clearly, however, the objective is to add as much DO as possible, so Voith's recommendations for how best to do this should be followed. This report also suggests that the aeration can be run down to 40% gate. The obvious question is what happens when one of these units is operating below 40% gate (which I'm not sure ever really happens). For now, I don't know that we need to do anything but to confirm that Units 4 (and 2 if the same restriction will apply there) would rarely, if ever, operate below 40% gate. However, it may be something we need to discuss further, as the upgrades on the remaining units (1 and 3) go forward.

Bottom line, I see nothing from a FERC/compliance standpoint to prevent APGI from closing out the work order.
-W

In a message dated 2/14/2008 12:28:52 P.M. Eastern Standard Time,

writes:

Wendy, any thoughts?

Paul, is the necessary work complete to close the order?

From: Atkinson, Carl *atc*
Sent: Thursday, February 14, 2008 9:44 AM
To: Parenti, David F.; Ellis, H. Gene
Cc: Tran, Paul; Lowder, Wayne (Fluor)
Subject: RE: Requirements For Narrows Generating Units 2 & 4

Dave and Gene,

I have attached our completed report on the aeration testing at Narrows Unit 4. The results of this report indicate a recommended minimum tailwater elevation of 368 ft for operation of the peripheral air valves on Narrows U1,2, and 4. Also, rather than the 50% gate limit previously identified by me in our conference call, the report recommends a 40% gate limit to maximize the amount of air admission to the water.

Please review the attached report and let me know if you have additional questions.

Gene - Please review your needs from the DO study that we have contracted with you. I think this is the culmination of our scope in that study. Any additional DO testing required on Narrows U2 after it goes into operation should be handled separately. I would like to close out this order if you will confirm that we have met your expectations.

Thank you,

Carl E. Atkinson, III, P.E.

Offer Project Manager
Voith Siemens Hydro Power Generation

From: Parenti, David F.
Sent: Thursday, February 14, 2008 9:03 AM
To: Atkinson, Carl
Cc: Tran, Paul; Lowder, Wayne (Fluor)
Subject: FW: Requirements For Narrows Generating Units 2 & 4

Carl,
Where's the data from the Unit 4 work that was done last fall to help verify "part load" operation? I believe that information would be helpful in this discussion
Thanks,
Dave

From: Summers, David
Sent: Wednesday, February 13, 2008 10:48 AM
To: Wyman, Michael J. (Fluor Global); Crowley, William
Cc: Parenti, David F.; Tran, Paul; Lowder, Wayne (Fluor); Ellis, H. Gene
Subject: RE: Requirements For Narrows Generating Units 2 & 4

Jack,

Here are my notes:

1. Current DO Operations - Paul Tran indicated the DO valves for Unit 4 operated May - Nov. Valves are opened by operator. Valve either full open or closed - no throttling.
2. DO Studies - Gene Ellis mentioned APGI has performed water quality studies and is performing ongoing water analysis with Longview Associates.
3. DO Monitoring Plan - Gene Ellis indicated that a DO monitoring plan would start 6 months after the new FERC license is issued. Unit 4 performance is 1-2 mg/l of DO uptake using draft tube vent valves.
4. Unit 2 DO Valve Proposed Operation by Carl Atkinson - 1) DO operation between May - Nov 2) Each valve individually controlled. May operate one valve open or both. 3) Valve to be full open or full close - no throttling. 4) Unit min gate opening of 50% (to be verified by Voith) for opening DO valve(s). This will be PLC controls permissive to open valve(s). (Unit 2 output at 55% gate about 18 MW per Carl Atkinson) 5) Maximum tailwater level to be established for DO valve operation. Voith to supply tailwater limit. This will be PLC controls permissive to open valve(s).
5. Current DO Monitoring - Gene Ellis indicated that Narrows has instream data measurement recorder (data sondes) that measure temp, pH and DO. The data sonde is retrieved and data downloaded every week. APGI does not have current plans for either control room display / recording of DO measurements or automatic DO valve operation by PLC.
6. Check Valve Issue - Paul Tran mentioned the check valve back flow issue on Unit 4. Carl Atkinson mentioned that the DO check valves might start to flutter between loads of 16 -20 MW due to unstable draft tube vacuum. Carl Atkinson requested more data on the past check valve backflow events for Unit 4.
7. DO Operations Study - Mike Byrne indicated a DO operations study would need to be performed to establish operating Unit 2 operating performance to evaluate the vacuum valve performance, opening point for the DO valve, operation with one valve open, two valve opens, tailwater limits, etc. Wheelpit vacuum valve operation may be more effective at DO uptake than draft tube valves but closes full at gate opening of about 50%. This valve is on a mechanical linkage.

David Summers
Devine Tarbell & Associates, Inc.

From: Wyman, Michael J. (Fluor Global)
Sent: Tuesday, February 12, 2008 6:30 PM
To: Crowley, William; Summers, David
Cc: Parenti, David F.; Tran, Paul; Lowder, Wayne (Fluor); Ellis, H. Gene
Subject: RE: Requirements For Narrows Generating Units 2 & 4

Bill - Thanks!

Dave - Please add your comments and I will send out the minutes.

Thanks,

Jack Wyman
Alcoa/Fluor Alliance

From: Crowley, William
Sent: Monday, February 11, 2008 6:48 PM
To: Wyman, Michael J. (Fluor Global)
Cc: Summers, David; Parenti, David F.; Tran, Paul; Lowder, Wayne (Fluor)
Subject: RE: Requirements For Narrows Generating Units 2 & 4

Hi Jack,

Here are my notes from the conference call that took place on Jan. 22, 2008 in regards to the subject of the Dissolved Oxygen on the Narrows Units 1 and 2.

It was discussed that the DO would be required between the months of May through Nov.

The DO will be measured as necessary on the downstream/ discharge side.

The DO is required for APGI to maintain FERC licensing.

VSH to ensure proper operation of the check valves in the new DO pipelines on Units 1 and 2.

DTA will be providing the required PLC programming for the control of the DO motor operated valves.

VSH proposes that the DO valve opening controls be set at open at 50% wicket gate and above; closed below 50% gate.

Air Admission valve on top of head cover to open at about 50% gate and below.

Final settings of these valves to be checked and verified during commissioning.

Best regards,

Bill Crowley, P.E.

Project Manager

Voith Siemens Hydro Power Generation

From: Wyman, Michael J. (Fluor Global)
Sent: Thursday, February 07, 2008 8:46 AM
To: Crowley, William; Summers, David
Cc: Tran, Paul; Parenti, David F.; Lowder, Wayne (Fluor)
Subject: RE: Requirements For Narrows Generating Units 2 & 4

Bill/David,

See emails below. Please send me your notes from the conference call and I will send out to the team.

Thanks,

Jack Wyman
Alcoa/Fluor Alliance
Project Manager

From: Tran, Paul
Sent: Thursday, February 07, 2008 6:51 AM
To: Parenti, David F.; Lowder, Wayne (Fluor)
Cc: Wyman, Michael J. (Fluor Global)
Subject: RE: Requirements For Narrows Generating Units 2 & 4

Happy New Year from Vietnam! The year of the Mouse!

Wayne,
From the last conf call with VS, DTA, Gene Ellis, Jack Wyman and myself on this topic, Jack is supposed to put together the meeting notes.
Please remind him. It looks like Gene is still waiting for it.
Thanks,

PT

From: Parenti, David F.
Sent: Wed 2/6/2008 10:02 PM
To: Jones, Alan D.
Cc: Lowder, Wayne (Fluor); Bunker, William M.; Tran, Paul; Gross, Mark; Olson, Marshall L.; Ellis, H. Gene
Subject: RE: Requirements For Narrows Generating Units 2 & 4

Alan,
Wayne will get you the functional description of the logic that's been written by DTA (BOP engineering company)
DFP

From: Jones, Alan D.
Sent: Wednesday, February 06, 2008 4:01 PM
To: Ellis, H. Gene; Parenti, David F.
Cc: Lowder, Wayne (Fluor); Bunker, William M.; Tran, Paul; Gross, Mark; Olson, Marshall L.
Subject: RE: Requirements For Narrows Generating Units 2 & 4

*Anyone have any information on how this will operate?
Are these valves (fully) automated or will the dispatchers be required to call and have the valves opened as we do now. If this is the case we will have to have someone available 24/7.... Also, if they are automated, will we have indication of the valves status? Are there any load restrictions?*

Thanks

From: Ellis, H. Gene
Sent: Wednesday, February 06, 2008 2:20 PM
To: Jones, Alan D.; Parenti, David F.
Cc: Lowder, Wayne (Fluor); Bunker, William M.; Tran, Paul; Gross, Mark; Olson, Marshall L.; Ellis, H. Gene
Subject: RE: Requirements For Narrows Generating Units 2 & 4

Most RSA dates are tied to license issuance. These issues do not fit that category. So, we do have to meet the dates.

From: Jones, Alan D.
Sent: Wednesday, February 06, 2008 12:45 PM
To: Ellis, H. Gene; Parenti, David F.
Cc: Lowder, Wayne (Fluor); Bunker, William M.; Tran, Paul; Gross, Mark; Olson, Marshall L.
Subject: RE: Requirements For Narrows Generating Units 2 & 4

Gene, if the license isn't approved by FERC in time, will plans be to operate to the RSA as it applies to Narrows DO requirements?

From: Ellis, H. Gene
Sent: Wednesday, February 06, 2008 11:55 AM
To: Parenti, David F.
Cc: Lowder, Wayne (Fluor); Bunker, William M.; Tran, Paul; Gross, Mark; Jones, Alan D.; Olson, Marshall L.; Ellis, H. Gene
Subject: RE: Requirements For Narrows Generating Units 2 & 4

That's great the valves are in! Sounds like the March 31 commitment is complete.

Are we on for May 1 and the subsequent commitments?

Generally, I like the idea of keeping the agency folks connected, but with all the activity around the 401 and DEIS, I wouldn't want to raise more attention than we have to at this point.

From: Parenti, David F.
Sent: Wednesday, February 06, 2008 11:48 AM
To: Ellis, H. Gene
Cc: Lowder, Wayne (Fluor); Bunker, William M.; Tran, Paul; Gross, Mark; Jones, Alan D.
Subject: RE: Requirements For Narrows Generating Units 2 & 4

Gene,
Thanks for the clarifications. The DO valves are physically installed on Narrows Unit 2. Maybe we should invite some of the agency reps in to show them the progress on the Upgrade project?
Dave

From: Ellis, H. Gene
Sent: Wednesday, February 06, 2008 8:58 AM
To: Bunker, William M.; Parenti, David F.; Tran, Paul; Gross, Mark; Jones, Alan D.
Cc: Ellis, H. Gene
Subject: Requirements For Narrows Generating Units 2 & 4

Since minutes of our last call to discuss these issues have not been circulated, I wanted to clarify what the terms of the RSA and the 401 Water Quality Certification require for Narrows Unit 2 DO enhancement. Requirements for Unit 4 originate elsewhere.

By March 31, 2008 - The addition of two aeration valves on Unit 2 (similar to those on Unit 4) must be installed.

By May 1, 2008 - If Unit 2 is operational, the two aeration valves must be operational and must remain "open" whenever Unit 2 is operating between May 1 and November 30. This requirement also applies to Narrows Unit 4.

As of May 1, 2008 - Whenever units at Narrows are operating, Units 4 and 2 (with aeration valves on), must be utilized on a "first on - last off" basis. In other words, if only one unit is operating at Narrows it must be Unit 2 or 4, if two units are operating it must be Units 2 and 4, if three or more units are operating, they must include units 2 and 4. If Units 2 or 4 are out of service for maintenance or other reasons, that unit is exempt from this requirement until it comes back on line. A record of such "outages" should be kept in case NCDWQ requires APGI to demonstrate compliance with this requirement.

Wendy Bley
Long View Associates