From: BOUCHER Marc
To: ROGER Michael;
Subject: FW: Hopper Foundry Shifting Peak Load to Daytime Operation
Date: Monday, December 21, 2009 1:57:18 PM
Attachments: Hopper Summary.pdf

As requested

From: BOUCHER Marc
Sent: Monday, October 26, 2009 10:27 AM
To: John Vickers (vel2@sympatico.ca); john Vickers (hoppfdry@xcelco.on.ca)
Subject: Hopper Foundry Shifting Peak Load to Daytime Operation

John

As discussed attached is a summary of our findings with respect to shifting load at Hopper Foundry.

Please let me know if you would like to discuss further or meet to review.

Thanks

Marc

Summary of Findings **October 14, 2009**

Hopper Foundry Shifting Peak Load to Daytime Operation

Introduction

The following is a summary of findings and recommendations with respect to enabling the potential shift of peak load at Hopper Foundry from night time to daytime operation.

System Monitoring

In the period of June 26, 2009 to July 7, 2009 voltage and current recording instrumentation was installed at four locations; two upstream and one downstream of the foundry on Hydro One Networks' distribution system and at the Hopper site. Monitoring on the Hydro One system was performed at locations on the 4.16/2.4 kV and 27.6/16 kV distribution network.

Findings

Based on current system conditions and Hopper shifting peak load to daytime operation it is expected that:

- Hydro One equipment ratings will not be exceeded.
- Forest Jefferson Distribution Station feeder F2 current balance before any load shift is currently above acceptable levels and needs to be rectified by Hydro One.
- Voltage levels and voltage balance on Hydro Ones distribution system are expected to be acceptable.
- Total Harmonic Distortion (THD) at Hopper Foundry during peak conditions appears to exceed the IEEE 519 limit of 5%. THD was measured at 12% during peak night time operation on the customer's 600 V system. This raised the THD at the other sites monitored however none were found to be above the 5% limit.
- There are a number of motors and welders at the Hopper Foundry. The maximum allowable inrush to maintain acceptable voltage dip is 350kVA. Hopper Foundry is generally meeting this limit.
- During contingency or planned outage conditions, complete feeder load transfers between Forest McNab Distribution Station feeder F1 and Forest Jefferson Distribution Station feeder F2 will overload the conductor on the Forest McNab F1. This system condition does not prevent Hopper Foundry from shifting to daytime operation.

Conditions of Service

Hydro One's conditions of service document Section 2.1 item M, for three phase services supplied at voltages below 13 kV, states that the maximum size of a service be limited to 501 kVA of transformation capacity at any delivery point. Although Hopper Foundry's connection does not meet this condition of service the arrangement pre dates Hopper Foundry becoming a customer of Hydro One Networks and as such is considered as grandfathered. Any future significant load addition at Hopper Foundry would need be reviewed prior to connection to ensure system capability is not exceeded.

Recommendations

- Based on the system monitoring conducted and subsequent analysis of current loading and system conditions, Hopper Foundry can shift to day time operation provided that the customer:
    - Restrict inrush to 350kVA
    - Address total harmonic distortion to meet IEEE 519 limits should neighbouring sites be found to exceed the 5% limit.
- Hydro One will rebalance feeder loadings on Forest Jefferson Distribution Station feeder F2 regardless of Hopper shifting to daytime operation.
- If complaints with respect to disturbances are received from other customers and are found to be attributed to Hopper Foundry and above accepted levels, then Hopper will be asked to take corrective actions as indicated in section 2.3.3 Electrical Disturbances of Hydro One's Conditions of Service.

From: BOUCHER Marc
To: "John Vickers";
Subject: RE: Hopper Foundry Shifting Peak Load to Daytime Operation
Date: Thursday, November 26, 2009 9:21:23 AM

John

We have reviewed your comments and offer the following points that I hope will help clarify the situation:

1. The feeder changes referred to are unrelated to Hopper shifting any load to day time operation. Based on our review of the local system we have determined that Hydro One will carry out this work as part of optimization of our 4kV feeder.
2. The furnace has not been ignored. During a site visit at the foundry, it was explained to our staff that the furnace load is gradually increased using a dial i.e. load doesn't go from 0 to 700kW in one time instance. Although we observed a voltage change it did not exceed acceptable limits.
3. It is possible that shifting load to daytime operations may cause problems for other customers. In order to be more definite we would need to work with you to trial Hopper shifting the furnace load to daytime operation in order that we could study neighboring customer impact. If you were agreeable to this, we would carry out a post load shift voltage and current study at Hopper Foundry and another neighboring connection to ensure power quality is acceptable.

John, our technical people are available to meet with you to further discuss this issue. Please let me know if you would like me to set up a meeting.

Thanks

Marc

From: John Vickers [mailto:vel2@sympatico.ca]
Sent: Thursday, November 12, 2009 2:29 PM

To: BOUCHER Marc; hoppfdry@xcelco.on.ca
Cc: vel2@sympatico.ca
Subject: Re: Hopper Foundry Shifting Peak Load to Daytime Operation

Marc,
Thank you for the attached report.I have reviewed it and,
I have to admit I am confused by it for different reasons.
1) It appears HONI has some upgrades to perform at "Forest Jefferson Dist. Station.
2) The report mentions motors and welders at the foundry. It seems to ignore the largest load, whish we know is the furnace. it states that the max allowable inrush is 350 kVA, and states that Hopper is "generally meeting this". We know from your work that when we melt in the night we regularly draw 700 kw plus. Yes, we are below that in the daytime and in fact "generally", but we do have to run the furnace sometime.
3) You then go on to mention all the things we would be responsible to rectify, and limits on our operation, should we go to daytime melting, and our load was to cause problems for our neighbours.
This is clearly NOT a green light, track is clear, endorsement to proceed to daytime melt with no concerns or restrictions.
Frankly, this just confirms what we always have been told, i.e. there would be problems if we melted on daytime peak hours.
Anyway,thanks again for your efforts and help.
We will be attending the OEB hearings and will plan to present our case to the OEB panel next month.
Thanks again,
John

> ----- Original Message -----
> **From:** marc.boucher@HydroOne.com
> **To:** vel2@sympatico.ca ; hoppfdry@xcelco.on.ca
> **Sent:** Monday, October 26, 2009 9:26 AM
> **Subject:** Hopper Foundry Shifting Peak Load to Daytime Operation
>
> John
>
> As discussed attached is a summary of our findings with respect to shifting load at Hopper Foundry.
>
> Please let me know if you would like to discuss further or meet to review.

Thanks

Marc

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