ONTARIOPOWER GENERATION

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N-FORM-10134-R002*

Barrier Analysis Worksheet

Consequence(s) (What Happened?) *(List one at a time, need not be in sequential order.)*	**Barrier(s) that should have Precluded Event**	**Barrier Failure Mechanism (How the Barrier Failed)** *(List all physical and administrative barriers for each consequence.)*	**Barrier Assessment (Why the Barrier(s) Failed)** *(Identify if the barrier was missing, weak, or ineffective; and why.)*
Unsafe grating: the opening cut into the grating did not include the mandatory banding to reinforce the cut edges to safety transfer the load around the cut-out. As a result, the grating East and West of the hole cut for the dewatering pipe is now unsafe. Workers enlarged an 180 mm x 180 mm grating opening to about 250 mm x 250 mm, but because it was late in the day, planned to weld the required banding the next day. No signs or barriers where in place when this was discovered and described in SCR D-2013-17008. Work was being performed under approved RCMT field change 13720-FC-00007.	ECC Process	The failed barrier was lack compliance with OPG Engineering Change Control (ECC) Procedures, N-PROC-MP-0090, for field changes and N-DAI-00150-10000, Contractor/Owner Interface Requirements for Nuclear, Section 3.76-3.79 which require intent changes to be process by EC revision and not by Field Change process.	Barrier was weak because of non-conservative decision to process change to grating through the Field Change process instead of EC revision.
Pipe supports use a steel plate held down with sandbags have been installed, but without the sand bags. The resulting design is using gravity and friction to resist hydraulic flow loads in a plastic pipe. Field change EC 13720-FC-00018	ECC Process	The failed barrier was lack compliance with OPG Engineering Change Control (ECC) Procedures, N-PROC-MP-0090, for field changes and N-DAI-00150-10000, Contractor/Owner Interface Requirements for Nuclear, Section 3.76-3.79 which require intent changes to be process by EC revision and not by Field Change process.	Barrier was weak because of non-conservative decision to process change to support through the Field Change process instead of EC revision.

*Associated with N-STD-RA-0008, Incident Investigation

(FIC 04) was approved on 01 October 2013 to use a steel base plate and sandbags to support the dewatering discharge line. The original design specified in EC 123123 R001 could not be installed because of numerous embedded electrical interference in the concrete that the support was to be anchored to. Sandbags, however, were not installed due to concerns about losing sand into the CW flow.			
The field installed equipment is based on a design prepared and verified by non-P.Eng. employees of the EPC contractor, and approved by the (then) Senior VP who is a mechanical P.Eng. Since the engineer failed to P.Eng. stamp the design as required by Ontario Law, it is unclear if he is aware that the design is his responsibility	Compliance with CSA N286.	Failure of MSA contractor to comply with CSA N286 and PEO requirements including independent verification and qualification requirements.	Less than adequate awareness of MSA contractor of the combined CSA N286 and PEO requirements.
The contractor engineering product was not accepted by OPG, as required by the Design Agency Interface Agreement.	Compliance with ECC Procedures	Changes to the grating and the pipe support were not recognized as intent changes and the wrong process was used by the MSA contractor to process this change. Changes were processed through the Field Change Process, which does not require OPG review, unless requested by the MSA contractor, per N-DAI-00150-10000, Contractor/Owner Interface Requirements for Nuclear,	Barrier was weak because of non-conservative decision to process changes through the Field Change process instead of EC revision.

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		Section 3.76-3.79. Change that should have been processed as an intent change to EC 123123 which requires OPG review.	