

Commissioning Huntly Unit 5

Industry briefing
20 November 06

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Agenda

- Welcome – Kieran Devine, GM System Operations
- Introduction (5 min)
- Technical changes (15-20 min)
 - Risks covered
 - Tool changes
- Operational process (15-20 min)
- Scenarios and impact analysis (15 min)
- Questions and discussion (45 min)
- Close

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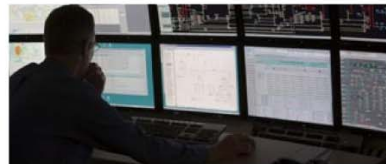
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Technical changes required to manage the commissioning of Huntly U5

Steven Nutt
Senior Investigations Engineer

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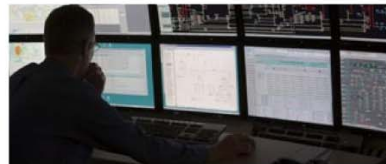


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Risks covered

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Risks to the system during commissioning

- Huntly U5 is a single shaft Combined Cycle Gas Turbine (CCGT) with a generating capacity of 385MW
 - **HLY5 an unproven generator; under frequency performance yet to be established**
 - **The tripping of HLY5 as a single contingent event is covered by usual practices**
 - **The major risk in commissioning HLY5 is that the unit trips or reduces load significantly at the same time as another generator trips (secondary contingent event)**
 - **Commissioning taking place at low demand period (December, January and February).**

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Period of Risk

- A period of risk has been identified by Genesis and Mitsubishi when HLY5 may trip as a secondary event which is during combustion tuning (they have identified this as a low risk).
- This risk has to be managed by the System Operator.

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Options considered for managing risk during commissioning

1. Covering HLY5 as a Secondary Contingent Event (CE) at all times during commissioning.
 2. Covering HLY5 as a Secondary Extended Contingent Event (ECE) at all times during commissioning.
 3. Treating HLY5 the same as a commissioned generator at all times during commissioning.
 4. Covering HLY5 as a Secondary CE, ECE or normal risk during the course of commissioning (depending on the risk).
- Option 4 is our chosen option as a reasonable and prudent operator.

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Types of risk covered

When covered	Type of Risk		Result
Usual practice	Contingent Event	Loss of the single largest generator or one pole of the HVDC link	Reserves bought to limit the fall in system frequency to 48Hz
	Extended Contingent Event	Loss of the HVDC Bipole	Reserves bought plus AUFLS to limit the fall in system frequency to 47Hz
Additional to usual practice during HLY5 commissioning	Secondary Contingent Event	Loss of the single largest generator or one pole of the HVDC link plus HLY5	Reserves bought to limit the fall in system frequency to 48Hz
	Secondary Extended Contingent Event	Loss of the single largest generator or the HVDC Bipole plus HLY5	Reserves bought plus AUFLS to limit the fall in system frequency to 47Hz

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Secondary Contingent Event Risks

- Reserves purchased to limit system frequency excursion to no lower than 48 Hz.
- CE Risks: -
 - largest other generator + HLY5
 - HVDC Pole + HLY5.

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Transition between Secondary Contingent Event and Extended Contingent Event

- A series of System Ride Through tests planned to establish under frequency performance of HLY5 and confirm that unit will not trip or significantly reduce in output as a result of a frequency disturbance
 - test will be carried out by Genesis with the agreement of the System Operator. Test will involve dropping the system frequency to 49.4Hz
 - on successful completion of each test HLY5 will be cleared to generate at a specific load level as a secondary ECE.

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Secondary Extended Contingent Event Risks

- ECE Risks modelled to 47 Hz so the fall in system frequency is arrested by use of scheduled reserves and operation of Automatic Under Frequency Load Shedding (AUFLS)
 - largest other generator + HLY5
 - HVDC Bipole + HLY5.
- ECE assessed less likely to trip for an other event.

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