AEMO Future Power System Security Program update

April 2016

Program overview

The Future Power System Security Program aims to identify opportunities for, and challenges to, power system security that could arise in the long term (nominally a 10-year outlook), and promote solutions as soon as practicable where appropriate.

The program explores a number of areas – including frequency control, fault levels, system restart, cyber security, modelling and tools, and market information – to constructively inform what actions may be required by AEMO and the industry to provide for the continued efficient management and secure operation of the power system of the future.

These actions may include adapting AEMO's functions and processes through changes to: responsibility and standards; access to information; provision of services; and, operational processes and procedures.

The initial focus of this program is to understand the technical nature of the opportunities and challenges, their interlinkages, the conditions under which they may arise and the consequences should they arise. With this understanding, proposed solutions to these challenges will be more holistic, and will consider the overall technical needs of the power system, as well as their economic efficiency.

Industry collaboration

Industry collaboration and consultation is essential to achieving the program aims and AEMO is working closely with stakeholders to explore future power system security. In December 2015, AEMO established the Power Systems Implications Technical Advisory Group (PSI TAG) to provide expert technical input and assist AEMO to identify and prioritise the technical opportunities and challenges in operating the power system of the future under Australia's evolving energy markets.

Advisory group members include transmission and distribution network service providers, emerging technologies, conventional generation, retailers, the Standing Committee of Officials, the Australian Energy Market Commission and the Australian Energy Regulator. More information about the advisory group terms of reference and scope is available on the AEMO website.

Program components

AEMO is working with the advisory group to develop a comprehensive list of potential future technical challenges by mid-2016. AEMO will also publish summaries of the potential future challenges as they are identified through this process.

Over the second half of 2016, AEMO will conduct analysis to understand the implications of the high priority challenges and progressively develop possible solutions as the need is verified. These may include changes within the current Rules and policy framework, which AEMO will progress, or Rules or policy changes to be progressed by the appropriate agency.

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Summary of Advisory Group workshops to date

The initial advisory group workshop, held in December 2015, generated broad discussion seeded by a list of potential technical challenges floated by AEMO. AEMO then compiled a revised list of possible technical opportunities and challenges for further analysis based on this discussion.

From this revised list, the challenges were grouped and refined for further discussion in subsequent workshops. The second workshop, held in February 2016, considered a 'deep dive' into the challenges of frequency control.

The third workshop, held in March 2016, road-tested AEMO's summary of the technical challenges associated with frequency control to ensure it was fit to proceed to further analysis. Feedback was to include any historical analysis where the identified technical challenges have already manifest.

It was also noted that the technical challenges are not mutually independent and the linkages between challenges need to be made apparent to reduce the risk of actions being proposed for individual challenges in isolation. For example, the conditions that give rise to low system inertia (and therefore provide challenges managing the effects of rapid changes in system frequency) will also lead to reducing system strength (low fault levels). Potential solutions need to be mindful of the linkages as addressing one without the other may not be effective or efficient.

The group also explored the challenges posed by low fault levels, reduced controllability, system restart, and operational information and power system modelling tools. AEMO will develop a report summarising the group's perspectives on these challenges, to present at the next advisory group workshop.

Coming up

The next advisory group meeting will convene in May, where AEMO will seek feedback on its summary of the above challenges and ask the group to assess the relative priorities and implications of the challenges to provide a roadmap of further analysis.

For more information, head to the Future Power System Security Program page on the AEMO website (http://www.aemo.com.au/Electricity/Market-Operations/Power-system-security) or contact Rob Jackson, rob.jackson@aemo.com.au