PSS®E 36 Transition

Fact Sheet

Summary of changes

AEMO uses PSS®E studies to support network operation, connections, and security. AEMO is requesting industry support with the transition from PSS®E version 34 to version 36 over the next 24 months.

What are the benefits?

AEMO has made the decision to transition all studies to use PSS®E version 36 for the following reasons:

- PTI Siemens will end support for PSS®E version 34 in October 2024.
- PSS®E version 34 automation is based on Python 2.7 which is now depreciated and poses a security risk.
- PSS®E version 36 dynamic model source code is version independent, meaning AEMO will not have to recompile models for future versions.

What is the timeline for the transition?

AEMO will begin requiring dynamic model source code in both PSS®E versions 34 and 36 from 14 April 2025. AEMO anticipates the full transition to be completed by July 2026.

AEMO will update the Power System Modelling Guidelines in due course following the transition to reflect future modelling requirements.

What will this change mean for the industry?

The transition will require a coordinated effort from industry, including NSPs, applicants/developers and OEMs. Based on a July 2026 target, this includes:

- Existing dynamic models: AEMO is currently transitioning all existing dynamic models to version 36 independently. No action is expected from current generation asset owners.
- New & Current Applicants: models submitted throughout the connection and registration process will be needed in both PSS®E versions 34 and 36 from 14 April 2025
- Future Applicants: PSS®E version 34 models will no longer need to be provided from 1 July 2026.
- NSPs: NSPs are recommended to transition to PSS®E version 36 as soon as possible to maintain alignment with AEMO modelling capability.

Technical facts – Modelling requirements

- Models must be compiled with Intel OneAPI Fortran Compiler version 2024.2 or a later version.
- Models must not contain any LPDEV commands in the source code, as this function has been discontinued.
- During the transition period, AEMO will require DLLs submitted for models that are compatible with both PSS®E version 34.5+ and PSS®E version 36 (this may require two separate DLLs to be submitted).

- Although existing dynamic models used in PSS®E version 34 may function in PSS®E version 36, users should review models for any required updates or replacements due to changes in modelling standards, for example:
    - File Compatibility: New features in version 36 may not work if the model is used in version 34.
    - Dynamic Model Compatibility: User defined dynamic models may need to be recompiled or updated for PSS®E version 36. Any changes in the API or functions will need to be checked.
    - Solver Differences: Although the core functions are similar, it is recommended to check the model's results after upgrading due to version 36.
- Users may need to convert existing RAW, DYR, and other network data files to ensure compatibility with the updated file formats in PSS®E version 36.
- Enhanced data precision in PSS®E 36 may necessitate adjustments in data preparation, particularly for large-scale power system models. For example, instead of entering 230.0 kV in version 34, 230.123 kV may need to be entered in version 36 to take advantage of the enhanced precision.
- Users may need to download or configure new model libraries included in PSS®E version 36.

AEMO appreciates your support with the ongoing operation and maintenance of this critical modelling capability.

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Frequently asked questions

Will PSS®E version 35 models ever be required?

No, AEMO is moving directly from version 34 to version 36.

Will this affect existing and already commissioned plant?

No, AEMO will transition existing dynamic models independently.

Can AEMO and NSPs specifically request PSS®E version 36 models?

Yes, as per AEMO's Power System Modelling Guidelines, participants must submit PSS®E models compatible with version 34.7 **at a minimum**. AEMO and NSPs can request participants submit models compatible with newer versions, such as version 36.

How are LPDEV commands removed?

The general structure of a PSS®E write statement meant for output to the progress window would look as follows:

```
WRITE(DBUF01, format_statement) output_data
Call PROGRESS(dbuf01,number_of_lines_of_dbuf01)
```

where, 'format_statement' is the format statement number to write the 'output_data' into the buffer 'DBUF01', and 'number_of_lines_of_dbuf01' stands for the number of lines in the buffer 'DBUF01' that need to be flushed out via call to 'PROGRESS'.

Examples of code:

Example 1:

```
WRITE(LPDEV, *) 'Under Voltage Relay TRIP...'
```

Becomes:

```
WRITE(DBUF01, *) 'Under Voltage Relay TRIP...'
CALL PROGRESS(DBUF01,1)
```

Example 2:

```
IF (.NOT. Printed) THEN
   WRITE(LPDEV, '(//" BUS",I7,"  MACHINE ",A,",MODEL ABC1:")') IBUS, IM
END IF
```

Becomes:

```
IF (.NOT. Printed) THEN
   WRITE(DBUF01,'(//" BUS",I7,"  MACHINE ",A,", MODEL ABC1:")') IBUS, IM
   CALL PROGRESS(DBUF01,3)
END IF
```

How is the code converted from PSSE 34 to PSSE 36?

The user will need to install the 'PSSE User Model Compile/Link - Environment Manager' with the PSSE 36 install. In the Environment Manager go to the code converter tab. Add the PSSE 34 code and proceed with the conversion.

What if I am having issues with the changeover?

If you are having issues with the changeover or benchmarking, AEMO will provide assistance. Please contact us at psse36transition@aemo.com.au

What other software does AEMO use for compiling PSSE 36?

Microsoft Visual Studio 2022 (Community Edition)

Microsoft Build Tools 2022

Intel Fortran Compiler (Stand-Alone Version)

Where can I find more information?

AEMO modelling requirements	https://aemo.com.au/energy-systems/electricity/national-electricity-market-nem/participate-in-the-market/network-connections/modelling-requirements
Chapter 2 of the National Electricity Rules	https://www.aemc.gov.au/regulation/energy-rules/national-electricity-rules
PTI Siemens for further information including licensing	https://www.siemens.com/global/en/products/energy/grid-software/planning/pss-software.html

For any further enquiries, please contact Onboarding & Connections at contact.connections@aemo.com.au