# Best Practices When Using FIPS Compliant and Non-FIPS Compliant Products

1. Introduction

This document provides information on how to run Manitoba Hydro International (MHI) software products on machines that comply with Federal Information Processing Standards (FIPS).

To be FIPS compliant, an organization must adhere to the various data security and computer system standards as outlined and detailed in the FIPS. FIPS 140-2 is the current US Government standard used to approve cryptographic modules. FIPS compliance is generally required in institutions which handle or process government or defense-related information. It is also generally required of defense contractors working for the government, and also required in national labs which work with secret and top secret information and technology.

Currently, if a customer tries to activate certificate licensing to run an MHI product which is non-FIPS-compliant on a machine which enforces FIPS compliance, licensing will fail, and an error similar to the one shown below will display. Some measures to overcome this issue are listed below.
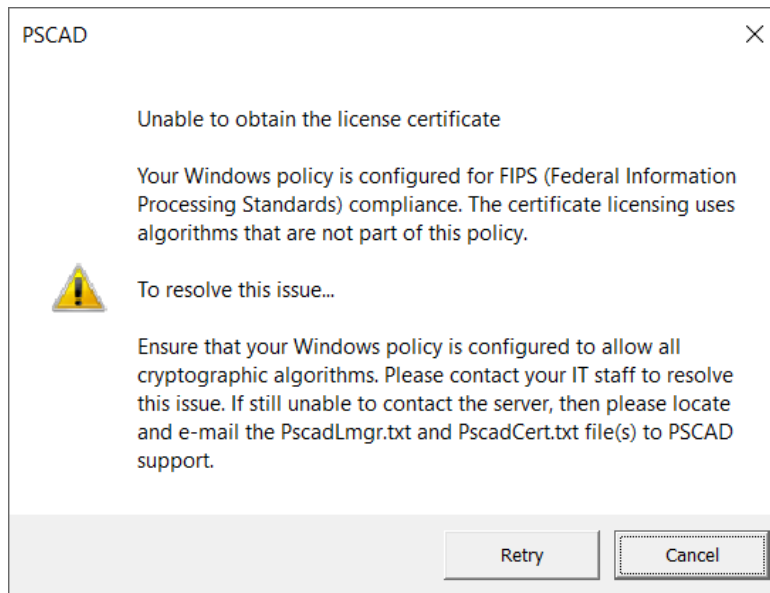
2. Affected Products

FIPS compliance only affects all products which use certificate licensing, specifically, in the loading and saving of the certificate licenses received from the server. When PSCAD is using lock-based licensing, FIPS-compliance is not an issue.

The following table displays the status of FIPS-compliance with regard to MHI products. As shown, FIPS compliance has been added to newer released products.

For PSCAD v4.2.1 to v4.5.0 in particular, these versions are considered compliant only by default because they only support lock-based licensing. For PSCAD v4.2.1 to v5.1.0+, the FIPS compliance issue does not affect any these products if lock-based licensing is being used instead of certificate licensing.

| Product	Versions	Uses algorithms compliant with FIPS 140-2	Release Status	Supports Certificate Licensing	Supports Lock-based Licensing
PSCAD	Beta	Yes	Not applicable	Yes	No
	Free (based on 5.0.2)	Yes	Released	Yes	No
	5.1.0 and better	Yes	Not yet released	Yes	Yes
	5.0.2	Yes	Released	Yes	Yes
	4.5.1 – 5.0.1	No	Released	Yes	Yes
	4.2.1 – 4.5.0	Yes[1]	Released	No	Yes
Enerplot	Beta	Yes	Not applicable	Yes	No
	1.1.0 and better	Yes	Released	Yes	No
	1.0.0	No	Released	Yes	No
PRSIM	1.1.0 and better	Yes	Released	Yes	No
	1.0.0	No	Released	Yes	No
PSCAD Initializer	1.0.1 Update 4 and better	Yes	Released	Yes	No
	1.0.0 – 1.0.1 Update 3	No	Released	Yes	No
FACE	Beta 2.0.1 (2023.4.24 and after)	Yes	Not yet released Released	Yes	No
	2.0.1 (prior to 2023.04.24) 1.0.0	No	Released	Yes	No

1. **These versions only support lock-based licensing, so FIPS-compliance does not affect these versions.**

3.   Default Start-Up Mode

For all product versions that support FIPS, their default start-up mode is for non-FIPS-compliance. If a user wants to use the newer products in FIPS-compliant mode, a setting will need to explicitly be changed to do that, as described below. The reason that these versions default to non-FIPS compliance upon start-up is to ensure that, if legacy versions that do not support FIPS are also installed and used on the same machine, these versions are supported.

4.   Switching the Support FIPS Compliance Mode

On the newer, supported, PSCAD versions, go *Licensing* button | *Licensing Options*, and select the desired mode
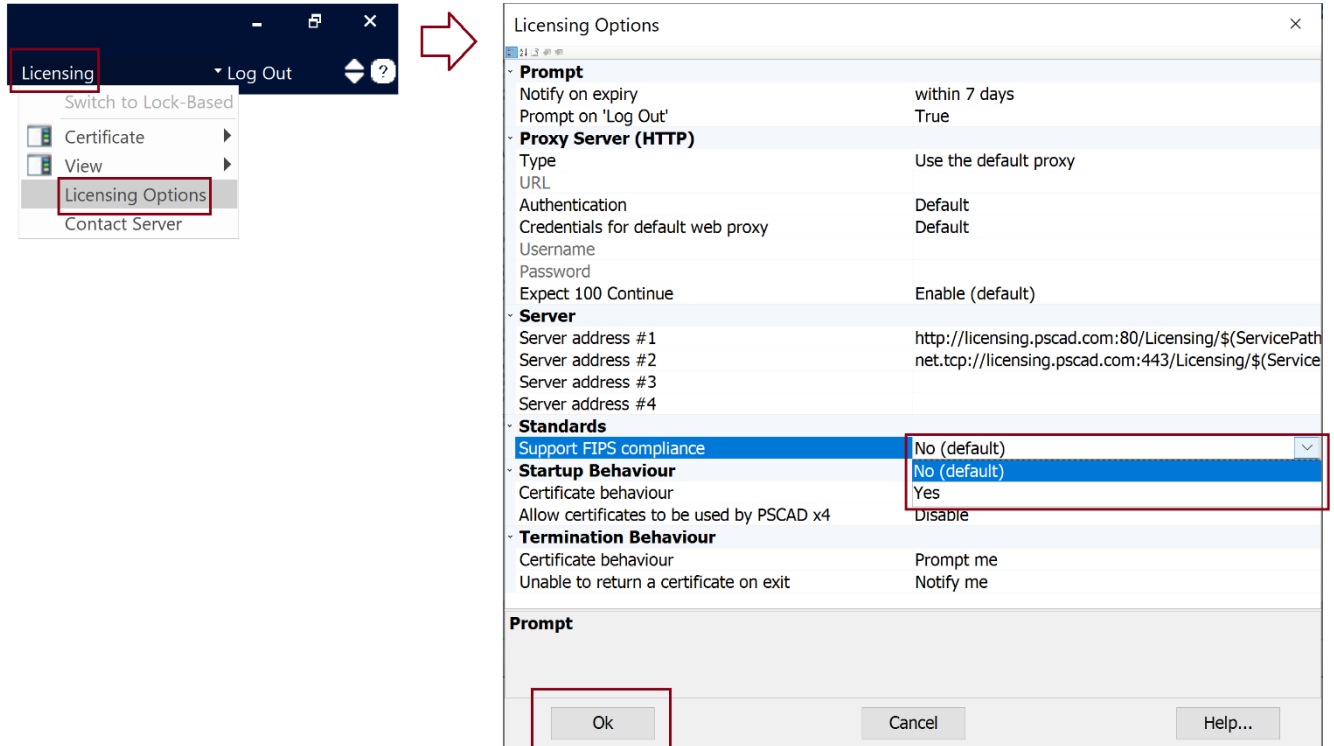
On the newer non-PSCAD products, go *License* | *Settings*, and select the desired mode
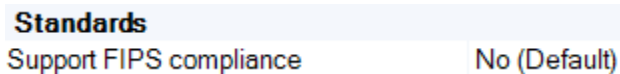
5.   Logging the Support FIPS Compliance Mode

All newer products will now log their FIPS-compliance setting in the licensing log file, as shown below. The log file may be located as per this article.

```
Application Settings:
    Support FIPS compliance     No (Default)

Application Settings:
    Support FIPS compliance     Yes
```

6. Using Non-FIPS Compliant Products in a FIPS-Compliant Environment

Some FIPS-compliant institutions need to use older non-FIPS-compliant MHI products. This can be done in two ways:

1. Run the non-compliant products on machines which are exempted from the FIPS-compliance policy, or

2. Use a batch file in elevated mode to

   a. Clear the FIPS compliance bit in the registry to disable FIPS-compliance

   b. Launch the non-compliant software

   c. Set the FIPS compliance bit in the registry to re-enable FIPS-compliance once the software terminates or exits

7. Using FIPS-Compliant Products in a Non-FIPS-Compliant Environment

When using FIPS-compliant products in an environment that does not enforce FIPS-compliance, you can leave the products run in their default non-FIPS compliance mode. See the table below for further information.

8. Best Practices Recommendations

Machine Registry Setting	Running FIPS Compliant Product A	Running non-FIPS Compliant Product A	Recommended Configuration
FIPS-compliance not enforced		Yes	Let older product run in its default non-FIPS compliant mode as there is nothing to change
	Yes		Let newer product run in its default non-FIPS compliant mode
	Yes	Yes	(mixed mode) Let both products run in their default non-FIPS compliant mode
FIPS-compliance is enforced		Yes	Use either of the two methods described in *Step 6 above*
	Yes		Configure product to support FIPS-compliance
	Yes [1]	Yes [2]	[1] Configure product to support FIPS-compliance [2] Use either of the two methods described in *Step 6 above*

DOCUMENT TRACKING

Rev.	Description	Date
0	Initial	29/Jan/2022
1	Update	31/Jan/2022
2	Formatted and improved	11/Apr/2023
3	Updated to PSCAD v5.0.2 release	24/May/2023
4	Updated to PSCAD v5.0.2 Release	01/Jun/2023
5	Updated to PRSIM v1.1.0 release Correction to PSCAD Free Edition status	06/Oct/2023