# Software Configuration Control Guidance and Review – KDB 594280

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# Software Configuration Control for Non-SDR

- Software configuration control considerations
  - Professional installation
  - Different operations modes under rule parts
  - Master – Client considerations
  - Extended frequency operations
- Permissive changes to existing radios under the rules
  - Class II permissive changes
  - Restrictions on who can make changes
  - Clarifications of changes under grantee control
- Considerations for Modular grants
  - Grantee responsibilities
  - OEM control

# Background

- Third parties can not have the capabilities to make configuration control changes and software changes that can allow the transmitter to operate outside of the RF conditions as granted unless the transmitter is approved as Software Defined Radio (section 2.944 and KDB 442812)

- Software changes that effect RF parameters may be permitted under a Class I or Class II Permissive except for an increase in maximum output power for the same equipment class - line entry- this requires a new FCC ID per Section 2.1043 (KDB 178919)

- Changes to the software installed in a transmitter that affect the radio frequency emissions may not be made by parties other than the Grantee (holder of the grant of certification).

# Who are Third Parties

- Third parties can not have the capabilities to make configuration Control changes/ software changes … (except as a Software Defined Radio).
- Third Parties are all parties except the grantee or any party legally contracted to the grantee such that the grantee remains liable by the contracted relationship for any actions of the contracted party.
  - end users,
  - professional installers,
  - repair shops etc.
  - Distributors

# Software Configuration Control

- Grantee is responsible to ensure that third parties can not operate the device out of compliance of the technical rules under which the device has been certified.
  - Country code selection is not permitted
  - This includes frequency selection parameters, (such as Dynamic Frequency Selection (DFS) for radar detection), using country codes;
  - professionally installed equipment, properly authorized installers may adjust the output power if the equipment authorization may be configured on-site

# Non-SDR Software Configuration Control – Application Guidance

- If the device has the ability to operate outside the grant conditions and such capabilities are controlled by software, the application must clearly explain how the control prevents third party modification. In particular for the following cases,
  a. Device is authorized to operate on extended frequency ranges
  b. Device that can operate as section 15.202 clients in some bands and 15.202 master in other bands with software based control
  c. Device which has capabilities not activated in the original grant but will require class II permissive change filing to enable them
  d. Modular devices where software drivers are provided as part of the module for OEMs.
- Initial or Class II filing for Non-SDR transmitters listed above (a-d) must provide a technical and operational software description on how the control is maintained to ensure compliance

# Section 15.202
# Master/Client Background

- For devices operating under Part 15 rules defines the roles of master and client devices
- Master devices can initiate a network but must only be authorized to operate in compliance with the rules
- Client devices cannot initiate a network (including sending beacons, probes, etc.) but must be under master control
  - Allowed to have extended frequency operation
- Any software configuration control of non-SDR transmitters must ensure that third parties cannot modify the master – client functions.

# Software based Permissive Changes to Non-SDR Devices

- Guidance below is applicable if no hardware changes have been made that requires a new FCC ID and with proper operational description to ensure that no third parties can make changes.
  - Additional frequencies may be added (Class II)
  - Frequency band capability of the device is decreased.
    - Then the change is permitted under a Class I change procedure.
    - the applicant desires to change the grant frequency range listed on the grant, then a Class II permissive change procedure is required..
  - Decrease in output power, or with a different field strength (Class II)
  - Change or additions of a new frequency bands subject to new technical requirements adopted post initial grant. An increase in power in this case is permitted for the new post initial grant technical requirement (Class II)
  - Adding new line items on the Form 731 is allowed (Class II) except for:
    - Increase in Output power
    - New Equipment Class

- For all permitted software changes RF exposure issues must be addressed.

# Class II Permissive Changes through Software

- Only Grantee can make the changes to new products developed after the grant has been issued
- Under certain circumstances (see KDB 178919) grantee may allow authorized parties to make changes for new products
  - If the grantee has contractual agreements with specific third parties and such agreements are provided in the filings
  - Filing must be made with the Commission
- Under certain circumstances grantee may be able to permit changes to devices deployed in the field for devices controlled by the grantee directly, through authorized service providers or parties
  - Class II PC filing made directly with the Commission including the following items:
    - Brief description of the arrangement between parties or a contractual agreement with specific parties,.
    - Software control process used by the parties (including the grantee and specific third parties) to ensure that reasonable safeguards are in place to ensure that the device cannot be modified by unauthorized parties,.
    - An attestation from the grantee indicating that they continue to be the responsible party to ensure compliance.

# Conditions of Use of Software Control for Modules

- Comprehensive instructions for the Host manufacture must be included in the Form 731 exhibits.
- For modules, Host manufacture may have the capability to use ancillary software or conditions that can cause the module to operate outside of the grant conditions.
- Software drivers and consideration for unauthorized protocol stacks that can violate compliance.
- Grantee is responsible for documenting-as a condition of use- any required software/operating conditions that must not be violated.
- A operational description indicating that no third party shall have software, or configuration control, to program the device out of compliance of the technical rules under which the device has been certified.

# TCB Review Requirements

- For the applications not subject to exclusion list, TCBs must ensure that proper review is performed for non-SDR software configuration control
  - Ensure that software control descriptions are provided not just that it will be exercised but how
  - Options include:
    - Software driver controls
    - Hardware locks and controls for US operations
    - Limited distribution of drivers and other authentication methods

# Questions and Answers

**Thanks!**