Chapter 71

ISIM Engineering

71.1 Introduction

The ISIM Engineering templates are used for OSS related maintenance of the onboard scripts and to update science instrument configurations. These activities may be used to update the Dictionary File or perform Application Specific Integrated Circuit (ASIC) Tuning. These templates can be found with the Spacecraft (SC) templates.

The following fields are defined in Chapter 5: Observation Number (5.1), Observation Label (5.2), Observation Comments (5.3), and Observation-Level Special Requirements (5.5), and will not be discussed in this Chapter.

The ISIM Engineering templates consist of the following parameters:

Field	Details	Values	Notes
ISIM Dictionary File Update [ISM0001]			
Dictionary Type **[ISM0002]**	select Dictionary type	CMD, TBL, TLM, SOI **[ISM0003]**	
Action **[ISM0004]**	select Action type	INIT, CHANGE **[ISM0005]**	
Dictionary File Name **[ISM0006]**	specify filename **[ISM0007]**		
ISIM ASIC Tuning [ISM0016]			
Science Instrument **[ISM0008]**	select instrument	FGS, NIRCAM, NIRISS, NIRSPEC **[ISM0009]**	
ASIC Tuning File Name **[ISM0010]**	specify filename **[ISM0011]**		
Data Volume **[ISM0012]**	specify data volume	Number **[ISM0013]**	
ASIC Tuning Duration **[ISM0014]**	specify duration	Number **[ISM0015]**	

71.2 ISIM Dictionary File Update

The ISIM Dictionary File Update template is to be used by the Commanding Team for initializing or updating one of four "dictionary files" onboard and synching the onboard scripts with the modified dictionary file(s). The dictionary files are generated by the Commanding Team from Project Reference Database items and used by the onboard scripts to construct Flight Software commands, table loads and telemetry requests, and to retrieve symbol-of-interest mnemonics. The ISIM Dictionary File Update visit is not intended to be a real-time visit. However, the ISIM Dictionary File Update visit will need to be scheduled in the onboard Observation Plan such that it is compatible with the PRD items used by onboard scripts that are executed in subsequent visits.

Multiple Dictionary updates may be done at once **[ISM0017]**.

Note to developer: Populate the order_number field for each separate update specification **[ISM0018]**.

Note that this type of visit must be PRIME only **[ISM0019]** because this visit changes the version of the Dictionary File(s) on-board and the Dictionary file(s) version must be in sync with the on-board scripts at all times.

71.2.1   Dictionary Type

DICTIONARY TYPE [DICTIONARY_TYPE] = CMD [ISM0020], TBL **[ISM0021]**, TLM **[ISM0022]**, SOI **[ISM0023]**

This parameter is used to select the Dictionary Type – **CMD** (command), **TBL** (table), **TLM** (telemetry) or **SOI** (symbol-of-interest).

71.2.2   Action

ACTION [ACTION] = INIT [ISM0024], CHANGE **[ISM0025]**

This parameter is used specify the action to take. **INIT**, or initialize, indicates that the dictionary file will be the first onboard for that dictionary type. **CHANGE** indicates that the dictionary file is replacing an existing file for that dictionary type. The previous dictionary file is deleted by the dictionary file update script if this option is specified.

71.2.3   Dictionary File Name

This parameter is used to specify the dictionary **FILE NAME [FILE_NAME]**, with extension (e.g. IC14_141106.cin) **[ISM0025]**. Note that OPGS will automatically prefix "ram:/" to the filename when generating the visit f6le.

Note for developers: APT should automatically set Target to NONE **[ISM0027]**.

Note for developers: The database visit table values should be:

internal_target = 'Y' **[ISM0028]**
external_target = 'N' **[ISM0029]**
pcs_mode = 'NONE' **[ISM0030]**
schedule_as_parallel = 'N' **[ISM0031]**
parallels_allowed = 'N' **[ISM0032]**
realtime = 'N' **[ISM0033]**
required = 'Y' -> Special Requirement **[ISM0034]**
data_volume = 0 **[ISM0035]**
science_duration = 60 sec per file **[ISM0036]**
scheduling_duration = 60 sec per file **[ISM0037]**
charged_duration = 60 sec per file **[ISM0038]**
(All other duration fields in the "visit" relation = 0) **[ISM0039]**

71.3 ISIM ASIC Tuning

The ISIM ASIC Tuning template is to be used by the Commanding Team to execute onboard ASIC tuning studies with a user-specified configuration file for either FGS, NIRCam, NIRISS or NIRSpec (MIRI does not have any ASICs).

ISIM ASIC Tuning observation(s) may be scheduled with a parallel SI **[ISM0040]** or in parallel with other ASIC tuning observation(s) **[ISM0041]**, except for NIRCam ASIC Tuning, which must be scheduled as a prime visit **[ISM0042]** and no parallel SI operation **[ISM0043]**. Note that there is mechanism motion by the user-specified SI during the ASIC tuning visit and that OSS will prevent mechanism motion from occurring during a parallel SI exposure.

71.3.1   Science Instrument

SCIENCE INSTRUMENT [INSTRUMENT] = FGS [ISM0044], NIRCAM [ISM0045], NIRISS [ISM0046], NIRSPEC [ISM0047]

This field specifies the science instrument configured by ASIC Tuning file. This field is used for scheduling purposes only.

71.3.2   ASIC Tuning File Name

This parameter is used to specify the ASIC tuning **FILE NAME [FILE_NAME]** with extension
(e.g. NRCCMB_003.at8) **[ISM0048]**. Note that OPGS will automatically prefix "ram:/" to the
filename when generating the visit file.

71.3.3   Data Volume

This parameter specifies the **DATA VOLUME [DATA_VOLUME_MIB] [ISM0049]**
generated by the ASIC tuning file in Mebibytes (1024^2 bytes).

Note to developer: This value is a non-negative integer **[ISM0050]** with no default **[ISM0051]**
or upper limit **[ISM0052]**. The label for the field should be MiB **[ISM0053]**.

71.3.4   ASIC Tuning Duration

This parameter specifies the **DURATION [DURATION]**, in hours, **[ISM0054]** needed to
execute the ASIC Tuning visit.

Note to developers: This value is a positive real number **[ISM0055]** with no upper limit.
[ISM0056]

Note to developers: APT should automatically set Target to NONE **[ISM0057]**.

Note for developers: The database visit table values should be:

internal_target = 'Y' **[ISM0058]**
external_target = 'N' **[ISM0059]**
pcs_mode = 'NONE' **[ISM0060]**
schedule_as_parallel = 'N' **[ISM0061]**
parallels_allowed = 'N' **[ISM0062]**
realtime = 'N' **[ISM0063]**
required = 'Y' -> Special Requirement **[ISM0064]**
science_duration = duration specified by user **[ISM0065]**
overhead_duration = 0 **[ISM0066]**
scheduling_duration = duration specified by user **[ISM0067]**
charged_duration = duration specified by user **[ISM0068]**
(All other duration fields in the "visit" relation = 0) **[ISM0069]**