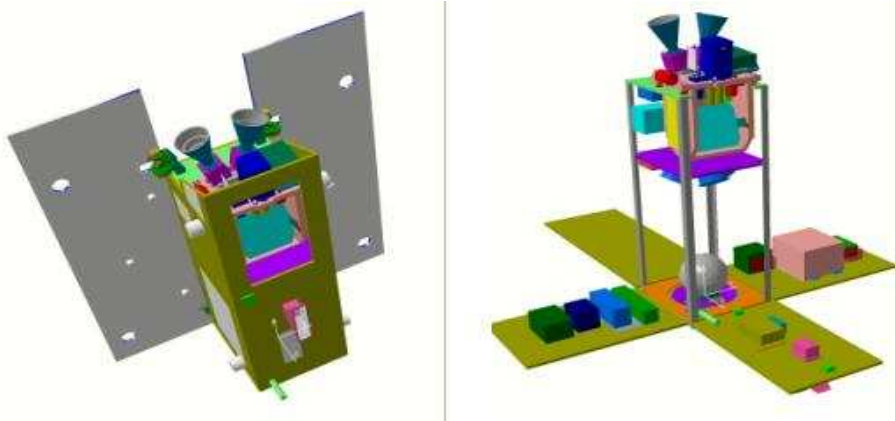


METHODOLOGY FOR THERMAL MODELS ARCHIVING



ESTEC, 22 Oct. 2003

OBJECTIVE:

1. To create a methodology and the associated software two archive the thermal model (THERMICA/ESARAD and ESATAN)
2. To define a thermal model delivery requirements

ESTEC, 22 Oct. 2003

BENEFITS:

1. ARCHIVE THERMAL FILES IN ASCII FORMAT
 - Storing all the data
 - Possible to rerun the cases
2. DELIVERY FORMAT with trace ability of the data
3. INTERNAL AUDIT
4. BATCH RUNS

ARCHITECTURE:

1. Pre_TERESA Fortran program
 - Generate a unique data file, called input file
 - Generate a control file with:
 - Name and number of radiative and thermal model files
2. Run_TERESA Fortran program
 - Split the input file
 - Run the Thermica models
 - Mount the ESATAN models
 - Run ESATAN models

Preprocessing: Pre_TERESA

- Input file generation

ASK about number of ESATAN
models and names

MODELX.ESA
MODELY.ESA
MODELZ.ESA

ASK about total number of
THERMICA models

ASK about total number of internal
THERMICA models

MODELA
MODELB

ASK about total name of external
and internal THERMICA models

MODELC
MODELD

Preprocessing: Pre_TERESA

- Input file generation

ASK about additional files number
and names

Power1.dat
Power 2.dat

ASK about PATH of ESATAN
models

ASK about PATH of THERMICA
models

ASK about PATH of Additional
files

Preprocessing: Pre_TERESA

- Input file

MODELA.SYSBAS
MODELA.THER
MODELA.TRJINP
MODELA.PNTINP
TEMP.MODELA

MODEL.C.SYSBAS
MODEL.C.THER
TEMP.MODEL.C

Power1.dat
Power2.dat

MODELX.ESA
MODELY.ESA.

REQUIREMENTS FOR ESATAN FILE (.ESA)

- GR's → ?include=RMODELA99R.TAN
- ARRAY heat inputs → ?include=HMODELA99H.TAN
- Subroutine → ?include=SMODELA99H.TAN
- Average → ?include=AMODELA99H.TAN
- Additional files → ?include=power1.dat

REQUIREMENTS FOR THERMICA FILE (.ESA)

- SYSBAS, ORBIT, POINTING and SIMULATION FILE have the same name MODELA
- Run a subprocess
- Open the *.COM file and delete the execution line
 - PATH+ Thermic32SGI
- Execute the *.COM file and appears TEMP.XXX
- Rename TEMP.XXX to TEMP.MODELA

USES:

- **One ESATAN Case**
 - **One external model**
 - **Several internal models**
- **HOT and COLD ESATAN cases**
 - **Two external models**
 - **Several internal models**
 - **HOT and COLD power files**

USES:

- **GENERAL CASE**
 - **Several ESATAN models (hot stowed, cold stowed, hot deployed, cold deployed, survival,...)**
 - **Several external models (hot stowed, cold stowed, hot deployed, cold deployed, survival,...)**
 - **Several internal models**
 - **Several power files (OFF, ON maximum, ON minimum, survival, heaters,...)**

THERMAL SOFTWARE REMARKS:

- **Filtering of radiative couplings**
 - **Percentage or minimum value**
- **Don't use formula for conductive couplings**
 - **Conductor value lower than 20**
- **Material data base**
- **Software for thermo-optical and material degradation**