

National Aeronautics and
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Reply to AEM of:

FA31 (91-174)

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TO: Distribution

FROM: FA31/Billy W. Nunley

SUBJECT: Tethered Satellite System Mission-1 (TSS-1), Science
Training Requirements for Joint Integrated Simulation
(JIS) Participation

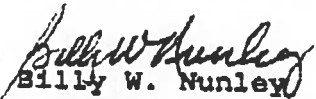
The assessment of science training requirements for TSS-1 JIS participation is enclosed. Per the Payload Integration Plan (PIP), Annex 7, Training, we, the payload community, are required to participate in five JIS's. The number of JIS's was first negotiated in 1988 and documented in the Integrated Payload Flight/Ground Operations Review data package (released for review in November 1989). As of the ninth flight operations working group meeting, the science community has further agreed to participate in one additional simulation since the fourth tabletop simulation was cancelled.

This assessment takes into account the number of JIS's baselined in the PIP Annex 7 plus the additional simulation, the portion of the mission covered by each JIS, and the realtime responsibilities of each principal investigator (PI) and PI support team member. The assessment of science training requirements is divided into four parts as follows:

- a. Ground rules and assumptions (review carefully).
- b. A brief description of the voice protocol exercise, the five JIS's, and the new JIS.
- c. A layout of mission phases, PI and support team shifts, simulation timeslices, and a subsequent listing of which shifts need to support which simulations.
- d. Given the above information and the support team position descriptions, an assessment of the number of shifts from each PI support team position needed to support each of the simulations.

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Please review this information thoroughly. If you have any questions or comments, please contact Earl Maynard at 205-544-0162, or Cindy Fry at 205-544-1861 (SPAN to 8201::CFRY).


Billy W. Nunley
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Enclosures

Distribution:
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PART 1**TSS-1 SCIENCE TRAINING REQUIREMENTS
GROUND RULES AND ASSUMPTIONS**

o This assessment of science training requirements covers science participation in TSS-1 simulations only. It does not include participation in other meetings between now and launch since these meetings (POWGs, FOWGs, etc.) have not yet been scheduled.

o TSS-1 training requirements, per the TSS-1 Payload Integration Plan, Annex 7, Training, states: "... all customer personnel who will reside at JSC for real-time mission support will require simulation training ..."

-- In Table 2-2 of Annex 7, the Detailed Training Syllabus, all Payload Support Team and Science Support Team personnel are listed as being required to participate in the Voice Protocol Exercise and five Joint Integrated Simulations (JISs).

o The amount of JIS participation by science team members is proportional to the amount of interaction they have outside their team.

o Back-up or support personnel will attend the minimum required training sessions.

o Intra-team training is the responsibility of the PIs.

o Ground team personnel participating in the sims will be exercised.

-- The JISWG is currently developing the scripts for all TSS-1 simulations.

-- This assessment will be used in their script development.

o All sim dates are planning dates only.

-- We are working with JSC to maximize training efficiency by coupling as many sims as possible in order to minimize travel for the payload customer.

-- For resource allocation planning, assume one full day before and after each sim, or group of sims, for pre-sim briefings and checkout, and post-sim de-briefs.

o There was insufficient data provided from the following PI teams to determine minimum training requirements: OESEE, TEMAC, TMST, and TOP. Where possible, an assessment of training requirements was made based upon the position title and complexity of the experiment operations. Otherwise, the assumption made was that all science team personnel would be required to participate in all sims.

o Since no PI/PI Support Team Shift Plan was available, the following assumptions were made:

- All shifts are twelve hours in length, plus one hour before and after for shift handover (total on-console time: 14 hours/shift).
- The PIs and their support teams will stagger their shifts to maximize continuity in science operations, and to minimize the number of people in the SOC during the mission.
- Since PI and support team shifts are staggered, and to avoid confusion when referring to the various shifts, the PI shifts are labelled RED and BLUE, and the support team shifts are labelled SILVER and GOLD.
- The RED PI team will be on-console from just prior to flyaway until approximately half-way through OST1. This shift sets the shift times and durations for the BLUE PI team and the SILVER and GOLD PI Support Teams.

PART 2**TSS-1 SIMULATION SCENARIOS****VOICE PROTOCOL EXERCISE**

Date: 3/24/92
Duration: 8 hours
Synopsis: Paper sim to exercise pre-calibration, post-calibration science timeline

JIS#1 - TSS ON-STATION #1

Date: 3/25/92
Duration: 10 hours
Synopsis: Exercise OST1 operations

NEW JIS - TSS ACTIVATION

Date: 3/31/92
Duration: 8 hours
Synopsis: A compilation of activation timeslices taken from the start of PDC through post-deploy

JIS#2 - TSS LONG DEPLOY

Date: 4/21/92
Duration: 12 hours
Synopsis: Activation to 20 km deployed

JIS#3 - TSS ON-STATION #2

Date: 4/22/92
Duration: 6 hours
Synopsis: 2.7 km "creep" on-station operations

JIS#4 - TSS LONG RETRIEVE

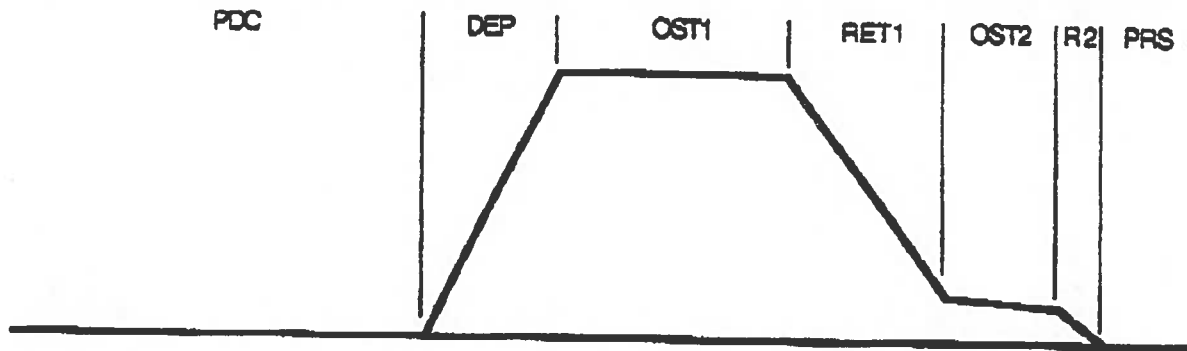
Date: 5/12/92
Duration: 16 hours
Synopsis: 20 km to deactivation

JIS#5 - TSS LONG SIM

Date: 5/19 - 5/20/92
Duration: 36 hours
Synopsis: Mission profile rehearsal

PART 3

TSS-1 Science Simulation Attendance Planning



PI Shifts:

Red
 Blue

PI Support Team Shifts:

Silver
 Gold

JIS Schedule:

JIS#1
 New JIS
 JIS#2
 JIS#3
 JIS#4
 JIS#5

TSS-1 SIMULATION ATTENDANCE REQUIREMENTS

	VPE	JIS#1	New SIM	JIS#2	JIS#3	JIS#4	JIS#5
PI SHIFTS							
Red	X	X		X	X	X	X
Blue	X	X	X	X		X	X
PI SUPPORT TEAM SHIFTS							
Silver	X	X	X			X	X
Gold	X			X	X	X	X

PART 4

TSS SCIENCE SIMULATION ATTENDANCE REQUIREMENTS
 (Numbers indicate the number of shifts required per sim)

	VPE	JIS#1	New SIM	JIS#2	JIS#3	JIS#4	JIS#5
MSCI							
Mission Scientist	2	2	1	2	1	2	2
Assistant MSCI	2	2	1	2	1	2	2
SETS							
Principal Investigator	2	2	1	2	1	2	2
SORD	2	2	1	2	1	2	2
Console 1 Operator	2	1	1	1	1	2	2
Console 2 Operator	2	1	1	1	1	2	2
Replan Coordinator	2	1	1	1	1	2	2
Science Tracker	0	0	0	0	0	0	2
Hardware Engineer	0	0	0	0	0	0	2
Software Engineer	0	0	0	0	0	0	2
SPREE							
Principal Investigator	2	2	1	2	1	2	2
SPREE Support	2	2	1	2	1	2	2
SPREE Data Analysis	0	1	1	1	1	2	2
SPREE Hardware	0	1	1	1	1	2	2
SPREE Software	0	1	1	1	1	2	2
SPREE SOC Support	0	1	1	1	1	2	2
CORE							
Principal Investigator	2	2	1	2	1	2	2
CORE Lead	2	2	1	2	1	2	2
Timeliner/Replanner	2	1	1	1	1	2	2
Hardware/Software Engine	2	1	1	1	1	2	2
SOC Support	2	1	1	1	1	2	2
ROPE							
Principal Investigator	2	2	1	2	1	2	2
Experiment Manager	2	1	1	1	1	2	2
Experiment Engineer	2	1	1	1	1	2	2
Experiment Displays	0	0	0	0	0	0	2
RETE							
Principal Investigator	2	2	1	2	1	2	2
RETE Support	2	1	1	1	1	2	2
ACBP Specialist	2	1	1	1	1	2	2
DCBP Specialist	2	1	1	1	1	2	2
TEAMG (*)							
Principal Investigator	2	2	1	2	1	2	2
TEAMG Support	2	1	1	1	1	2	2
Instrument Specialist	2	1	1	1	1	2	2
Data Analyst	2	1	1	1	1	2	2

TSS SCIENCE SIMULATION ATTENDANCE REQUIREMENTS
 (Numbers Indicate the number of shifts required per sim)

	VPE	JIS#1	New SIM	JIS#2	JIS#3	JIS#4	JIS#5
SOC Data System							
SOC System Manager	2	1	1	1	1	2	2
DCS Operator	0	1	1	1	1	2	2
SOC Displays	0	1	1	1	1	2	2
SOC Maintenance	0	1	1	1	1	2	2
TMST (*)							
Principal Investigator	2	2	1	2	1	2	2
Mission Monitor	2	1	1	1	1	2	2
TMST Analyst	2	1	1	1	1	2	2
IMDN/TEID							
Dynamics PI	2	2	1	2	1	2	2
PI Support	2	1	1	1	1	2	2
EMET							
Principal Investigator	2	2	1	2	1	2	2
OESEE (*)							
Principal Investigator	2	2	1	2	1	2	2
OESEE Support	2	1	1	1	1	2	2
TOP (*)							
Principal Investigator	2	2	1	2	1	2	2
TOP Support	2	1	1	1	1	2	2