

6 JUL 1999

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SPACE TRANSPORTATION SYSTEM REQUIREMENTS REPORT
PROGRAM SPECIFIC REQUIREMENTS

SUPPLEMENTAL MATERIAL TO

(b)(1)
(b)(3)
10 USC § 424

NRP REQUIREMENTS FOR
SPACE TRANSPORTATION SYSTEM FLIGHT OPERATIONS

CLASSIFIED BY: BYE-1
REVIEW ON: 6 July 1999

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This document is a compendium of program-specific materials prepared in support of the NRP Requirements for Space Transportation System Flight Operations Report.

This compendium is submitted concurrently with the report but separate from it. It provides detailed program descriptions and outlines shuttle-related activity. While some of these programs are currently approved and in the budget, others are in the very early planning stages. To preclude unnecessary distribution of information on current programs, and to protect the planning and preliminary information on others, it is recommended this supplemental material be retained at SAFSS for reference and that it not be further distributed.

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This document is a compendium of program-specific materials prepared in support of "Annex D: NRP Requirements for Space Transportation System Flight Operations," an annex to the Shuttle Mission Operations Task Force Evaluation Report (SMOTE).

This compendium is submitted concurrently with Annex D but separate from it. It provides detailed program descriptions and outlines shuttle-related activity. While some of these programs are currently approved and in the budget, others are in the very early planning stages. To preclude unnecessary distribution of information on current programs and to protect the planning and preliminary information on others, it is recommended this supplemental material be retained at SAFSS for reference and that it not be further distributed.

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NRP SHUTTLE REQUIREMENTS REPORT

FOR THE
ZEUS PROGRAM

1 MAY 1979

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PART A

NARRATIVE FOR THE ZEUS PROGRAM

1. PROGRAM DESCRIPTION

a. Project ZEUS is intended to be the photographic space program which will replace Program 467, satisfy standing search and MC&G requirements of the mid-1980s and beyond, provide the flexibility and capability of a film system, provide inherent responsiveness, and achieve low life-cycle cost. The ZEUS system will be STS optimized for launch economics, recovery and recycle, and payload vs STS parameters. The photographic hardware will utilize current technology in electronics, computers, software, and structural materials.

b. The current status of Project ZEUS is as follows:

- (1) Objectives and requirements are known
- (2) Technical feasibility has been established through studies
- (3) Hardware solutions have not been selected

c. The hardware designs being studied include palletized and free-flyer options. The palletized approach will be a fully integrated system utilizing STS Orbiter and ground support services and equipment. The Orbiter on-board processing capabilities may be used in conjunction with a real-time or near real-time man/payload interface to optimize the total photographic systems performance.

d. The free-flyer approach being investigated is considering the periodic retrieval of the entire payload versus the periodic refurbishment of the film and orbital support systems.

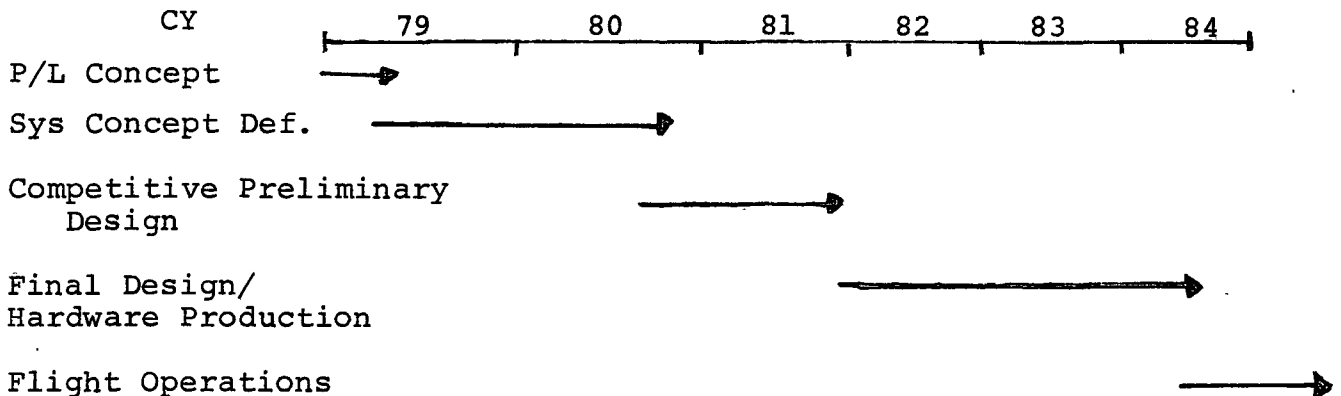
e. The orbital parameters for both options will be optimized to the Shuttle's capabilities. The operational orbit is expected to be between 120 - 160 NM circular when launched from the Eastern or Western Launch Sites (ELS or WLS). Current plans protect for a maximum of 6 palletized launches a year beginning in 1985 with possibly 4 launches in 1984. ELS launches will probably be at inclination of 57 degrees with WLS launches at a sun-sync (~~≈~~ 96 degrees) inclination.

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Preliminary Schedule



2. KEY SHUTTLE-RELATED MILESTONES

a. Hardware Delivery - The photographic hardware will be assembled and tested as an end item. It will then be integrated with the pallet (Platform Operations) or with the orbital support system (free-flyer options). This combination will then be tested as an end item. The complete assembly will enter the pad flow at the Solid Motor Assembly Building (SMAB).

b. Integration/Testing - The complete assembly (either option) will be tested for STS compatibility. While in the SMAB, functional checkout and verification will be performed. The entire cargo will then be mounted in the NASA canister for transportation to the pad.

c. Simulations and Training

(1) Pallet Option. All preflight mission peculiar (targeting) studies and orbit requirements analyses will be performed using program peculiar software. Mission requirements will then be passed to the STS support agency to develop the flight support packages. Since the ZEUS program is intended to be a fully integrated system, it will be extremely difficult to operate in the same mode as the [redacted] program. All crew training will involve some BYEMAN-level requirements. Ground support personnel training may involve BYEMAN-level requirements.

(2) Free-flyer Option. The same ground rules apply here as for the Pallet Option. However, ground personnel training can probably be held to DOD Secret.

d. Launches. Prelaunch and launch support requirements are TBD.

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3. DESCRIPTION OF SHUTTLE-RELATED OPERATIONS CONCEPT

a. The mission planning, command control and data processing related to ZEUS program objective will originate at a "to-be-specified" Control Center. The requirements for this Center have not been developed. However, possibilities exist that it could be similar to [redacted] for the free-flyer option and a fully integrated BYEMAN facility for the palletized operation.

(b)(1)

(1) Major Interfaces

(b)(3) 10 USC \pm 424

(a) Hardware to Shuttle - integration/testing at ELS or WLS

(b) Control Center - payload planning, command generation, data processing, etc.

(c) STS Center - telemetry, tracking, and data processing, etc. (may be combined with the Control Center)

(2) Any particular training need for Shuttle crew or Payload Specialist

(a) Payload Specialist (pallet option) - The Payload Specialist will probably have a very active role in real-time or near real-time implementation evaluation of photographic operation. Therefore, he will require extensive training in hardware design, orbital operations, and targeting strategies and philosophy.

(b) Payload Specialist (free-flyer option) - The Payload Specialist is required for checkout, deployment and anomaly response. He will require training in hardware and operations.

(c) Remaining crewmembers - Those crewmembers requiring Extra Vehicular Activity (EVA) access to the payload for anomaly response will require some training in hardware and operations.

(3) Typical Mission Duration. The mission duration studied have concentrated on 21-day photographic missions. This item remains flexible until the Orbiter resources kits are definitized.

(4) Any special crew participation - See Section (3) above.

(5) Ride-sharing potential - The design will attempt to maximize ride-sharing potential.

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4. PROJECTED LAUNCH SCHEDULE

a. Eastern Launch Site:

- (1) Scheduled Launches - 2 per year beginning FY 1985.
- (2) Contingency Launches - 2 per year beginning
FY 1985.

b. Western Launch Site:

- (1) Scheduled Launches - 1 per year beginning FY 1985.
- (2) Contingency Launches - 1 per year beginning
FY 1985.

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