

**NASA Interim Directive:
Collective Public Risk for Space Shuttle Entry from the Hubble Space Telescope Orbit
Inclination of 28.5 Degrees.**

BACKGROUND

NPR 8715.5, dated July 8, 2005, defines the NASA Range Safety Program and incorporates the Agency’s public risk acceptability policy for range operations. The NPR contains policy regarding collective public risk associated with Space Shuttle entries. The policy is specific to International Space Station (ISS) missions. In the timeframe leading up to Space Shuttle Return-To-Flight, during which NPR 8715.5 was developed, the only mission officially envisioned for the remaining Space Shuttle flights was to service and complete the ISS. The entry trajectories from the ISS orbit inclination of 51.6 degrees were evaluated and the collective public risk associated with each trajectory was assessed. This public risk assessment together with mission and crew safety considerations formed the basis for the policy, which was widely vetted and approved by the Agency. This policy has allowed the Space Shuttle Program to continue to use Kennedy Space Center as its primary landing site, and establishes a public safety risk threshold to be used when considering alternate landing sites.

Now that the Space Shuttle mission has been expanded to include Hubble servicing, the collective public risk policy must be revised and expanded to address entries from the Hubble orbit inclination of 28.5 degrees. The Agency has followed the same approach that was taken in developing the original policy for the 51.6-degree trajectories. The Space Shuttle Program, in coordination with NASA Headquarters, Office of Safety and Mission Assurance, has quantified and thoroughly evaluated the collective public risks associated with the 28.5-degree entry trajectories. Mission and crew safety concerns have been evaluated. These evaluations and assessments provide the basis for an addition to NASA’s collective public risk policy. As is the case for ISS missions, the addition to the policy will allow the Space Shuttle Program to use Kennedy Space Center as its primary landing site for the Hubble servicing mission, and, as with the ISS mission policy, it establishes a public safety risk threshold to be used when considering alternate landing sites.

POLICY

The NASA policy regarding collective public risk for Space Shuttle entries is contained in NPR 8715.5, paragraph 3.2.4.5c(4). With this NID, paragraph 3.2.4.5c(4) is replaced in its entirety (including the note at the end of the paragraph) with the following, which includes the new provision specific to the 28.5-degree entries and other minor editorial revisions (**all shown in bold font**):

- (4) Collective Public Risk for Space Shuttle Entry:
- (a) **For International Space Station (ISS) missions**, the assessed collective public risk for Space Shuttle entries shall not exceed the highest risk associated with the ascending

entry trajectories into Kennedy Space Center (KSC) from the ISS orbit inclination of 51.6 degrees except as described in paragraph 3.2.4.5.c(4)(c) (Requirement).

(b) For Hubble Space Telescope (HST) missions, the assessed collective public risk for Space Shuttle entries shall not exceed the highest risk associated with the entry trajectories into KSC from the HST orbit inclination of 28.5 degrees except as described in paragraph 3.2.4.5.c(4)(c) (Requirement).

(c) If an entry must take place under off-nominal conditions or when critical crew safety factors (e.g., landing site weather, Orbiter consumables, crew health and duty day) require the consideration of alternate landing site opportunities, the Space Shuttle Program shall balance the mitigation of public and crew risk in selecting the entry opportunity and landing site (Requirement).

*Note: **These provisions** are necessary due to the Space Shuttle's established design and operational constraints. Any significant alterations to Space Shuttle entry operations would have the potential for negative effects on crew and mission. **These provisions** allow the Space Shuttle Program to continue to use KSC as its primary landing site, with Edwards Air Force Base and White Sands Missile Range as backups. The Shuttle Program, in coordination with NASA Headquarters, has quantified and thoroughly evaluated the risks associated with **these provisions**. **Further details on the risk assessments and the implementation of these provisions are provided in NSTS-60561, Range Safety Risk Management Plan for Entry of the Space Shuttle Orbiter.***

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