

MSFC

Maximum Work Hour Guidelines



Presented by:
MSFC Industrial Safety Department
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Maximum Work Hour Guidelines*

- **Principle: excessive hours of work produce fatigue, increasing risk of errors & accidents**
- **Supervisors implement guidelines**
- **Apply to workers whose job performance can directly impact:**
 - Safety of others
 - Safety of high value NASA property
 - Safety of a mission
- **Can be applied to other workers, as well**

* From MPG 8715.1B, Appendix I





MSFC Maximum Work Periods*

- **12 Consecutive hours**
 - 16 Hours in an emergency situation
- **60 Hours during a workweek (7-day period)**
- **7 Consecutive days without at least 1 full day off**
- **240 Hours during a 4-week period**
- **2,500 Hours during a rolling 12-month period**

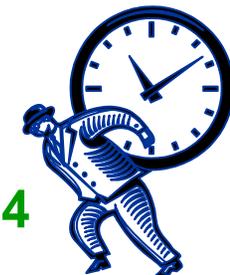
* From MPG 8715.1B, Appendix I





Controls Human Error Hazards

- **Noting & reacting to conditions in work area**
- **Assessing risks of work activities**
- **Predicting what is likely to happen**
- **Making judgments & decisions**
- **Operating equipment & vehicle controls**
- **Physical coordination & dexterity**
- **Patience & ability to adapt**





Extended Work Hours Contribute to Undesirable Incidents

■ Example 1

- The Hubble Space Telescope (HST) was in the Vertical Processing Facility (VPF) at KSC, where the crew had been working 7 days a week to process the HST.
- The crew had to work on Saturday, leveling the HST to prepare for an operation on the following Monday. The electronic level indicator had recently been recalibrated, and was not working properly.
- The crew was in a hurry as they started the leveling process. A loud noise was heard, and work was stopped.
- It turned out that engineers and technicians had overcorrected the HST, causing the HST upper support structure to lean into the side of the VPF finger platforms.
- Had the crew continued the leveling process for another minute or two, rather than stopping work, further contact with the platforms would have damaged the HST.

■ Example 2

- The HST vehicle shipment date was approaching, and test engineers were working late into the evening. They had been working for 16 consecutive hours or more.
- An engineer went under the HST to work, without noting that the vehicle had been rotated 180 degrees. While backing out from under the HST, he broke the flight low gain antenna off.





Extended Work Hours Contribute to Undesirable Incidents

■ Example 3

- Final assembly of the Hubble Space Telescope (HST) was in process for an October shipment date. A large scientific instrument was to be installed.
- The lead crane operator, who had already worked several days of overtime, received a phone call just before the installation operation began. He was informed that his 5-year old son was on the way to the emergency room.
- After the lifting operation began, the crane operator moved the load in the wrong direction. He over-compensated on the recovery, rapidly lowering the scientific instrument to the ground.
- As a result, special disassembly, inspection, and verification testing had to be performed on this flight hardware.

■ Example 4

- At KSC, the shuttle payload changeout canister was being proofload tested. The work was planned for day shift, but delays forced the test into the evening hours.
- The mobile crane normally used to lift the test weight failed. Although the workers wanted to stop work and go home, a different crane was brought in to make the lift.
- The new crane picked up the load, but it slipped several feet. Operators heard and saw this abnormal event.
- Because they wanted to go home, a second lift was attempted.
- This time, the load fell into the canister, narrowly missing several workers.





Extended Work Hours Contribute to Undesirable Incidents

■ Example 5

- An MSFC program had a fatigue-related flight hardware accident involving a battery contractor. The contractor was behind schedule, with the delivery date approaching.
 - The battery test engineer had been ill with the flu, and went to the doctor prior to coming to work.
 - While working alone, and late into the evening, the engineer misconnected the battery cables and burned up the batteries.
- **When possible, follow the MSFC guidelines for maximum work hours to avoid a safety mishap in your own work operations!**

