B/L: 393 00
SYS: ET C/O Cell Platforms

SEP 17 1996

Critical Item: Hoist Gear Drive (12 Items Total)

Find Number: None

Criticality Category: 2

SAA No:	09FY22-003	**System/Area:**	ET Checkout Cell Platforms, VAB High Baya 2 and 4
NASA Part No:	None	**PMN/ Name:**	K60-0550 2,000 lb and 4,100 lb Hoists
Mfg/ Part No:	Shepard Niles Crane and Hoist Corp./SA-19024	**Drawing/ Sheet No:**	79K09165/79K05424 24-29/111-115

Function: Provides power linkage between the main planetary gear and the compound planetary gear.

Critical Failure Mode/Failure Mode No: Disengages. FM No. 09FY22-003.001

Failure Cause. Structural failure due to broken teeth or gear eeparating from from shaft.

Failure Effect: Platform section could fall with sufficient force to break the hinges resulting in loss/damage to an ET.

ACCEPTANCE RATIONALE

Design:

- Design is in accordance with American Gear Manufacturers Association and Hoist Manufacturers Institute Standards with a minimum safety factor of 5 to 1.
- Pinion is integral to the main and compound planetary gear train. It would require a structural failure for any possibility of disengagement.
- Hoists are rated at 2,000 lbs and 4,100 lbs and are used to raise and lower platform sections in the ET checkout cell.
- These hoists are subjected to an extremely limited annual duty cycle compared to commercial use.

Test:

- Hoists are proof tested to 125 percent of rated load prior to initial use and after load sustaining parts have been modified or replaced (OMRSD 79K20911).
- An annual operational check of hoists is performed in accordance with OMI Q6258

- An operational test of controls is made before beginning an operation. If the controls do not operate properly, adjustments or repairs are made before operations begin (OMI T5144).
- OMRSD File VI requires performance of an operational load test of the platform(s)/hoist annually.
- Preventive maintenance will be performed per OMI Q6258.

Inspection:

- A visual inspection of the hoist gearbox for signs of the following conditions is performed annually, OMI Q6258 requirement:
  - corrosion
  - loose fasteners
  - oil level/leakage

Failure History:

- The PRACA database was researched and no failure data was found on this component in the critical failure mode.
- The GIDEP failure data interchange system was researched and no failure data was found on this component in the critical failure mode.
- Shepard Niles Crane and Hoist Corporation stated the only hoist gear drive failures in commercial use were not due to faulty design or manufacturer defects, but in every instance failure was attributed to shock loading while attempting lifts at higher than rated loads.

Operational Use:

- Corrective Action:

  There is no action which can be taken to mitigate the failure effect.

- Timeframe:

  Since no corrective action is available, timeframe does not apply.

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REV. B

Hoist Schedule

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High Bay #2

Level	Panel	Hoist	Capacity (lbs)	Avg. Load (lbs)
8	5	Shepard Niles Class RG	2,000	1,829
8	6	Shepard Niles Class RG	2,000	1,614
8	7	Shepard Niles Class RG	2,000	1,714
8	8	Shepard Niles Class RG	2,000	1,833
8	3	Shepard Niles Class RG	2,000	1,680
High Bay #4				
8	1	Shepard Niles Class RG	2,000	1,851
8	2	Shepard Niles Class RG	2,000	1,624
8	3	Shepard Niles Class RG	2,000	1,923
8	5	Shepard Niles Class RH	4,100	2,471
8	6	Shepard Niles Class RH	4,100	3,615
8	7	Shepard Niles Class RH	4,100	2,701
7	9	Shepard Niles Class RH	4,100	2,446

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Attachment 3
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