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Bill Thornton
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EW53-77-101

Rockwell International Corporation
Space Division
Attn: Mr. Edward P. Smith, Vice President and
Program Manager, Shuttle Orbiter
Downey, CA 90241

Subject: Contract NAS 9-14000, Waste Collection System Markings and
Control Guards, Technical Direction #R16327

In response to an action item established by OV102 CDR RID 04.01.14 a review of the Waste Collection System (WCS) mockup was conducted at JSC with General Electric engineering personnel. As a result of this review it was determined that the nomenclature for some of the controls was either deficient or inconsistent with the nomenclature used elsewhere in the Orbiter. Additionally, a review of the guarding techniques and rationale for the slinger speed control and the function switch, indicates that the present designs are overly complex and operationally unsuitable. Therefore, Rockwell is directed to have the following changes made in the WCS:

- a. Add the title MODE over the WCS function selector control in place of the OPERATION title and bracket.
- b. Change the function selector URINE/COMM position to WCS/EMU.
- c. If physically possible, add the title SLINGER SPEED to the FECES/EMESIS switch.
- d. To the commode slide valve handle, add a title, end position markings, and a revised instruction placard as shown in Enclosure 1.
- e. Add the title VACUUM VALVE (or VAC VLV) to the vacuum line control and change the position labels to OPEN and CLOSE.
- f. Add the title FAN SEP to the fan separator selector control and make the position labels simply 1 and 2.
- g. Delete the cover guard from the slinger speed control switch and change this switch to a lever lock type (locked in the EMESIS position). This change will permit the status of slinger speed selection to be more apparent and will assure that the speed is not inadvertently changed from low to high (with possible equipment damage), by accidentally

closing the cover guard. Also, the functional positions of the switch should be reversed, i.e., the nominal FECES position should be adjacent to the handhold, to minimize the possibility of this switch being a snag.

h. Do not use the seat pip-pin to lock the FUNCTION control to the WCS/EMU position during EMU servicing. Past program experience has shown that pip-pins are operationally unsuitable for this application. Furthermore, if a pip-pin were to be used, a separate pin, stowage capability, and lanyard would be required. This is more complicated than is necessary. All that is required is a means of alerting the crew that the EMU is being serviced. As has been suggested previously (C6SDR RID 04.01.26) some type of flip over placard located near the FUNCTION control and stating that the EMU is being serviced would be satisfactory.

The submission of this direction closes the action item established by the referenced CDR RID.

This letter is of particular interest to R. A. Schmitz, K. E. Shaw and O. T. Stoll.

ORIGINAL SIGNED BY:
AARON COHEN

Aaron Cohen
Manager, Orbiter Project

cc:
Rockwell-Houston
Rockwell-Downey/AC25/R. A. Schmitz
Rockwell-Downey/AB92/K. E. Shaw
Rockwell-Downey/FA15/O. T. Stoll

Enclosure 1

bcc:
NASA Hqs., MH/M. S. Malkin
BC4/S. D. Armstrong
✓ CB/P. J. Weitz
CG2/T. R. Neal
EC3/J. C. Brady
LA/Staff Office
LA/S. H. Simpkinson
LA/D. K. Slayton
LA12/J. G. Zarcaro
LA2/O. G. Morris
LA3/Rm M. Machell
LA5/D. C. Cheatham
LV/J. B. Jackson

MA/M. A. Silveira
MC/R. C. Hood
ME/R. W. Kubicki
MG/A. D. Aldrich
MR/W. B. Wilson
MT/A. Hobokan
PA/H. E. Gartrell

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LV/Rockwell
MC2/R16327
WC2/T. Grace

COMMODE CONTROL

READY
TO USE

PRIOR TO DEFECATION

1. PULL UP
2. WAIT 10 SEC
3. ← PUSH F.WD

DOWN
OFF