

SECTION I

PLUM BROOK ROCKET SYSTEMS DIVISION

TEST OPERATIONS REPORT

FOR THE MONTH OF

JANUARY 1974

SITE SITE NAME RESEARCH INSTALLATION & (TASK NO.) - PROJECT ENGINEERS

B-3

ROCKET DYNAMICS
AND CONTROL
FACILITY

CENTAUR STANDARD
SHROUD (CSS) TESTS
(Y0Q4239)

ENGINEERING EVALUATION TESTS

TCPO - R. W. HEATH;
RSD - L. C. GENTILE

DISCUSSION

OPERATIONS

Installation of the hard points, required for support of the hydraulic shear load cylinders, has been completed. Proof tests of the system are now in progress.

Four meetings were held with the TCPO project group to review the "Test Requirements Document". Detailed test load levels were defined and instrumentation, control and visual display requirements were reviewed.

Additional tests were conducted on the "Twang Test" deflectometers to determine the effect of extending string length.

Tests have been started to qualify the new hardware cylinders purchased for the engineering evaluation test series.

(Continued on Page 5)

NARRATIVES ON ADJOINING PAGE

PROJECT	SITE	TASK NO. (
STATUS		SCHEDULE

CHANGES: (schedule changes since last report)

CENTAUR STANDARD SHROUD TESTS B-3 Y0Q4239

ENGINEERING EVALUATION TESTS SCHEDULED FOR	Apr thru May 31, 1974.
<u>ITEMS COMPLETED</u> Installed hard points for load cylinders. Four meetings with TCPO project group. Review test requirements. Defined test load levels. Reviewed instruments, controls, and Visual Display requirements. Ran tests on "Twang" deflectometers. Completed proposal to modify error monitor. Tested a Houston deflectometer. Received all pressure transducers.	
<u>ITEMS IN PROGRESS</u> Qualifying new hydraulic cylinders. Checking loading actuators. Working on abort and alarm requirements. Sequencing, control & abort electrical interfacing is 90% complete. Working on T.R.D. Estimated completion February. Liquid level system is 90% complete.	

CHANGES: None

SITE	SITE NAME RESEARCH INSTALLATION & (TASK NO.) - PROJECT ENGINEERS
B-3	<p data-bbox="293 279 634 373">ROCKET DYNAMICS AND CONTROL FACILITY (Continued)</p> <p data-bbox="456 405 1101 436"><u>ENGINEERING EVALUATION TESTS</u> (Continued)</p> <p data-bbox="456 474 704 506"><u>INSTRUMENTATION</u></p> <p data-bbox="456 537 1398 632">Engineering work with TCPO on the T.R.D. for the Engineering Evaluation Tests is in progress. A final version of the T.R.D. is expected in February.</p> <p data-bbox="456 663 1414 831">At the request of TCPO a Houston deflectometer test was performed. The requirement was generated as a result of the SPF testing. The test proved that a three inch deflectometer, set to one-half inch, with a restricted five foot cable extension, would operate properly to ten hertz.</p> <p data-bbox="456 863 1382 926">The calibration of all accelerometers for the E.E. "Twang Test" has been successfully completed.</p> <p data-bbox="456 957 1398 1020">All required pressure transducers for E.E. tests have been delivered to B-3 Test Stand.</p> <p data-bbox="456 1052 1398 1209">Frequency response tests on Houston deflectometers without extension cables, have been completed. Deflectometers, in the range between three and eighteen inches, were tested. All deflectometers tested operated properly below four hertz.</p> <p data-bbox="456 1241 1317 1304">Work on the B-3 liquid level system is ninety percent complete.</p> <p data-bbox="448 1346 578 1377"><u>CONTROLS</u></p> <p data-bbox="440 1409 1365 1661">The "Twang Test" hydraulic load actuator has been installed and the facility hard points are being proof tested. The shear and payload hydraulic loading actuators are currently being checked out at D-Site. The new shear loading hardware and hard point will be proof tested about mid-month. The payload hydraulic loading actuator and its associated hard point will also be proof tested at this time.</p> <p data-bbox="440 1692 1414 1892">The proposal for modification of the Centaur Tank Protection error monitor for the CSS dynamic response test is complete. This proposal will be presented to TCPO on February 5 for their concurrence. Abort and alarm requirements will also be finalized on this date. Sequencing, control, and abort electrical interfacing is 90% complete.</p>

NARRATIVES ON ADJOINING PAGE

PROJECT	SITE	TASK NO. (
STATUS		SCHEDULE

CHANGES: (schedule changes since last report)

LOX FLOW TESTS F YOV6114

LOX FLOW TEST RUN SCHEDULE	March 1974.
<u>ITEMS COMPLETED</u>	
Cleaned LOX Tank	Jan 25, 1974
Installed anti-vortex baffle	
Installed tank lid	
Installed tank	
Fabricated and checked vent system	
Cleaned variety of equipment items	
Test section nozzle extension rewelded	
Received temperature sensors and liquid level system	
<u>ITEMS IN PROGRESS</u>	
Valves being assembled.	
Working on tank liquid level probe.	

CHANGES: Schedule Change.

SECTION II
PLUM BROOK ROCKET SYSTEMS DIVISION
TEST OPERATIONS REPORT
FOR THE MONTH OF
FEBRUARY 1974

SITE	SITE NAME RESEARCH INSTALLATION & (TASK NO.) - PROJECT ENGINEERS
------	--

B-3

ROCKET DYNAMICS
AND CONTROL
FACILITY

CENTAUR STANDARD
SHROUD (CSS) TESTS

ENGINEERING EVALUATION TESTS

TCPO - R. W. HEATH;
RSD - L. C. GENTILE

DISCUSSION

OPERATIONS

The new hydraulic cylinders have been tested and qualified for use. Proof testing of the recently installed pull points has been completed.

The Titan skirt was releveled on the lower distribution cylinder. Stack up of the Centaur components has started. The interstage adapter is in the process of being installed.

Site work on instrumentation, purge lines, etc., is in progress.

The "Test Requirements Document" has been distributed.

(Continued on Page 5)

SITE	SITE NAME RESEARCH INSTALLATION & (TASK NO.) - PROJECT ENGINEERS
B-3	<p data-bbox="289 285 532 378">ROCKET DYNAMICS AND CONTROL FACILITY</p> <p data-bbox="467 380 1114 410"><u>ENGINEERING EVALUATION TESTS</u> (Continued)</p> <p data-bbox="467 449 711 478"><u>INSTRUMENTATION</u></p> <p data-bbox="467 512 1373 576">The calibration work for accelerometers for EET has been completed.</p> <p data-bbox="467 612 1341 676">Cable work for strain gage and Centaur instrumentation at B-3 Test Stand is in progress.</p> <p data-bbox="467 710 1357 774">Work on installation of facility transducers is in progress at B-3 Test Stand.</p> <p data-bbox="467 808 1390 902">Engineering layout work for wire runs and connectors associated with test hardware strain gage instrumentation has been completed.</p> <p data-bbox="467 936 1357 1000">Work on strain gage instrumentation of test hardware at Space Power Facility is in progress.</p> <p data-bbox="467 1034 1422 1127">The extended length deflectometer test rig is now complete. Tests on deflectometers with extension cables are to begin shortly.</p> <p data-bbox="467 1161 597 1191"><u>CONTROLS</u></p> <p data-bbox="467 1225 1357 1421">The new 20 inch hydraulic loading actuators have been installed and checked out in B-3. The proof tests required for the Twang Test, Shear, and Payload have been successfully completed. The axial hydraulic loading actuators will be reassembled with loading hardware and a system check will be made in early March.</p>

NARRATIVES ON ADJOINING PAGE

PROJECT	SITE	TASK NO
STATUS		SCHEDULE

CHANGES: (schedule changes since last report)

LOX FLOW TESTS F Y0V6114

<p>LOX FLOW TEST RUN SCHEDULE</p> <p><u>ITEMS COMPLETED</u> Equipment cleaned and moved to test stand. Preliminary planning for routing of lines & equipment location accomplished. Tank liquid level probe assembled and cleaned.</p> <p><u>ITEMS IN PROGRESS</u> Valve shop working on valves for test.</p>	<p>Apr-May 1974.</p>
---	----------------------

CHANGES: Schedule Change

SECTION I
PLUM BROOK ROCKET SYSTEMS DIVISION
TEST OPERATIONS REPORT
FOR THE MONTH OF
MARCH 1974

SITE	SITE NAME RESEARCH INSTALLATION & (TASK NO.) - PROJECT ENGINEERS
B-3	<p>ROCKET DYNAMICS AND CONTROL FACILITY</p> <p><u>CENTAUR STANDARD SHROUD (CSS) TESTS</u></p> <p><u>ENGINEERING EVALUATION TESTS</u> - TCPO - R. W. HEATH; (YGP3211) RSD - L. C. GENTILE</p> <p style="text-align: center;">SCHEDULE - APRIL-MAY 1974</p> <p>The stack up for the Centaur Standard Shroud "Twang Tests" has been completed.</p> <p>All major components are in place. Cameras, instrumentation, etc., are being installed. Controls checks are in progress.</p> <p>The first test is scheduled for the first week in April.</p> <p>This initial series of tests will provide dynamic data, to verify the CSS Dynamic Model at loads above 25% limit. Tests will be conducted with and without the forward bearing reaction struts installed.</p> <p>The cryogenic structural test is scheduled for early May with the non-cryogenic structural test to follow shortly thereafter.</p> <p><u>INSTRUMENTATION</u></p> <ol style="list-style-type: none">(1) Work involving the dynamic testing of deflectometers for EET has been completed.(2) All accelerometers have been physically mounted on test hardware for EE twang test.(3) All cable work associated with FBR strain gages has been completed.(4) All deflectometers have been mounted and electrically checked out for EE twang test.(5) Other instrumentation including pressures, load cells, thermocouples and platinum temperature sensors have been installed and checked out for EE twang test.(6) Run boards have been patched in preparation for EE twang test. <p><u>CONTROLS</u></p> <p>The changeover from HTF to B-3 was accomplished on March 30, 1974. Validation for the "Twang Tests" is scheduled for April 1, 1974. The tank pressure safety system has been modified and checked out for the "Twang Test". All hardpoints and related hardware have been proof tested for all remaining tests.</p>

SECTION I
PLUM BROOK ROCKET SYSTEMS DIVISION
TEST OPERATIONS REPORT
FOR THE MONTH OF
APRIL 1974

SITE SITE NAME RESEARCH INSTALLATION & (TASK NO.) - PROJECT ENGINEERS

B-3 ROCKET DYNAMICS
AND CONTROL FACILITY

CENTAUR STANDARD
SHROUD (CSS) TESTS

ENGINEERING EVALUATION TESTS
(YGP3211)

TCPO - R. W. HEATH;
RSD - L. C. GENTILE

SCHEDULE - APRIL-MAY 1974

The "Twang Test" series was completed on April 8 and 9. The data appeared to correlate with the Centaur Standard Shroud Dynamic computer model.

Stack-up for the "Structural" Test series has been essentially completed. The final test series is scheduled for the first two weeks of May.

INSTRUMENTATION

The Engineering Evaluation Twang Tests were successfully completed the week of April 8.

Preparations were made for Engineering Evaluation Tests 7E and 3E. This included:

- (1) Installation and check out of \approx 40 deflectometers.
- (2) Final hook-up and check out of \approx 60 strain gages.
- (3) Pressure, temperature, load cell and liquid level set-up.
- (4) Patching of boards at B-2 test stand and B-Control Building.
- (5) End-to-end checks of all instrumentation channels.

CONTROLS

All support systems for the "Twang Tests" performed properly and were completed the second week of April.

The systems at B-Control were again changed from HTF to the B-3 configuration and preparations are now underway for the structural tests. The tank pressure safety system which was modified for the "Twang Tests" has been returned to its normal configuration.

SECTION I

PLUM BROOK ROCKET SYSTEMS DIVISION

TEST OPERATIONS REPORT

FOR THE MONTH OF

MAY 1974

SITE	SITE NAME RESEARCH INSTALLATION & (TASK NO.) - PROJECT ENGINEERS
------	--

B-3	ROCKET DYNAMICS AND CONTROL FACILITY
-----	---

CENTAUR STANDARD
SHROUD (CSS) TESTS

ENGINEERING EVALUATION TESTS
(YGP3211)

TCPO - R. W. HEATH;
RSD - L. C. GENTILE

SCHEDULE - COMPLETE MAY 1974

The "Engineering Evaluation Test" series has been completed.

Cryogenic test 7E was conducted on May 10, after two preliminary checkout exercises at reduced loads. Test 3E was made on May 15.

All test objectives were obtained and the strength envelope of the shroud was defined. Since the shroud was basically undamaged following the tests, it was decided to remove it and associated Titan/Centaur components from the B-3 tower.

Shroud components will be repackaged and stored in their original shipping containers at Plum Brook Station.

The stub adapter and equipment module will be returned to Lewis-Cleveland for additional testing.

The remaining hardware will be scrapped, recycled or stored at Plum Brook Station.

INSTRUMENTATION AND CONTROLS

Both the 7E and 3E structural tests were successfully completed. All control equipment performed satisfactory. All mechanical control equipment will be placed in storage. The electrical equipment will be left intact.