SECTION II

PLUM BROOK ROCKET SYSTEMS DIVISION

TEST OPERATIONS REPORT

FOR THE MONTH OF

JANUARY 1965

SITE	LABORATORY	RESEARCH INSTALLATIONS (FOR)	DESCRIPTION
B-1	HIGH ENERGY ROCKET ENGINE RESEARCH		
		NERVA (OT1011) (H. M. Henneberry)	NERVA engine propellant feed system tests. The investigation will include turbopump "bootstrapping" tests, fluid instabilities in the engine flow passages, and equipment performance evaluations.

On January 13, Liquid Hydrogen run #17 was completed. A maximum hydrogen flow rate of approximately 28 #/sec. was attained at a maximum pump speed of 8100 rpm. The run duration was 54 seconds. All data appears to have been satisfactorily recorded and there were no significant problems.

On January 27, Liquid Hydrogen run #18 was completed. A maximum hydrogen flow rate of 24 #/sec. was attained at a maximum pump speed of 7500 rpm. The run duration was 67 seconds. The data has not yet been reduced, however all the data appeared satisfactory at the conclusion of the test and no significant problems occurred during the run.

Other January work items were:

(1) The test stand heating system modifications were started. These modifications are required to increase the system capacity.

(2) Design work on facility modifications for Block II testing continued during January.

NOTE: Reactor structural tests have been added to the test program. They are scheduled to start in March 1966.

SECTION II

PLUM BROOK ROCKET SYSTEMS DIVISION

TEST OPERATIONS REPORT

FOR THE MONTH OF

FEBRUARY 1965

SITE	LABORATORY	RESEARCH INSTALLATIONS (FOR)	DESCRIPTION
B-1	HIGH ENERGY ROCKET ENGINE RESEARCH		
		NERVA OT1011 (H.M. Henneberry)	NERVA engine propellant feed system tests. The investigation will include turbopump "bootstrapping" tests, fluid instabilities in the engine flow passages, and equipment performance evaluations.

On February 10, liquid hydrogen run #19 was completed. A maximum hydrogen flow rate of approximately 23 #/sec. was attained at a pump speed of 6500 RPM. The run duration was 55 seconds. No significant problems occurred, and all data appear to have been satisfactorily recorded.

On February 24, liquid hydrogen run #20 was completed. A maximum hydrogen flow rate of 18 #/sec. was attained at a pump speed of 6000 RPM. The run duration was 75 seconds. No data has been reduced at this time; however, all data appeared satisfactory at the conclusion of the test.

Other February work items were:

(1) The test stand heating system modifications were essentially completed, with only a few minor items remaining to be done.

(2) Design work on facility modifications required for Block II testing continued during the month.

NOTE: The last test run in the Block I series will be completed by the end of March, and the facility will be shut down in order to start the modification work for the Block II series.

SECTION II

PLUM BROOK ROCKET SYSTEMS DIVISION

TEST OPERATIONS REPORT

FOR THE MONTH OF

MARCH 1965

SITE	LABORATORY	RESEARCH INSTALLATIONS (FOR)	DESCRIPTION
B-1	HIGH ENERGY ROCKET ENGINE RESEARCH		
		NERVA OT1011 (H. M. Henneberry)	NERVA engine propellant feed system tests. The investigation will include turbopump "bootstrapping" tests, fluid instabilities in the engine flow passages, and equipment performance evaluations.

On March 10, liquid hydrogen run #21 was completed. A maximum hydrogen flow rate of approximately 21 lb./sec. was attained at a pump speed of 7500 rpm. The run duration was 49 seconds. No significant problems occurred, and all data appear to have been satisfactorily recorded.

On March 24, liquid hydrogen run #22 was completed. A maximum hydrogen flow rate of 18 lb./sec. was attained at a pump speed of 5500 rpm. The run duration was 65 seconds. No data have been reduced at this time; however, all data appeared satisfactory at the conclusion of the test.

Other March work items were:

(1) The test stand heating system modifications were completed.

(2) Design work on the facility modifications required for Block II testing continued during the month.

NOTE: Due to a Block I program extension, the run schedule has been extended to early April. Following these runs, the facility will be shut down in order to start the modification work for the Block II series.

SECTION II

PLUM BROOK ROCKET SYSTEMS DIVISION

TEST OPERATIONS REPORT

FOR THE MONTH OF

APRIL 1965

SITE	LOCATION	RESEARCH INSTALLATIONS (FOR)	DESCRIPTION
B-1	HIGH ENERGY ROCKET ENGINE RESEARCH STAND	NERVA OT1011 (H. M. Henneberry)	NERVA engine propellant feed system tests. The investigation will include turbopump "bootstrapping" tests fluid instabilities in the engine flow passages, and equipment performance evaluations.

On April 7, liquid hydrogen run #23 was completed. A maximum hydrogen flow rate of 31#/sec. was attained at a pump speed of 10 000 rpm. The run duration was 20 seconds.

On April 13, liquid hydrogen runs #24 and #25 were completed. A flow rate of 31#/sec., at a pump speed of 10 000 rpm was attained on run #24. A flow rate of 28#/sec. at a pump speed of 8 500 rpm was attained on run #25. Total run duration for these tests was 35 seconds.

On April 27, liquid hydrogen run #26 was completed. The turbopump system was bypassed for this run to obtain system dynamics data. A flow rate of 24#/sec. was obtained with a run duration of 24 seconds.

In mid-April, a decision was made by Lewis Management to transfer the NERVA Program from "B-1" to "B-3" where testing will be run on an alternating basis between full scale pump tests and system dynamics tests. The essential elements of the research hardware will be removed from "B-1" along with required instrumentation for transfer to the "B-3" stand.

Since no program presently exists for this facility, it will be maintained on a "standby" basis. This report will constitute a final status report until a research program is initiated for the B-1 Facility.