PROGRESS REPORTS NO. 33 AND 34

31839

Subject: National Advisory Committee for Aeronautics
Propulsion Science Research Laboratory
Project No. 794 (NAw-5652) - B&R W.O. #1218

April 6, 1950

cc: NACA-4
EJT

RCR
RFC
WAB
KAR
WLG-3
RRB-2
FN
PJM
JBM
AAV-4
KBH-3
WGC-3
RDK-3
LHR-4
GHT
DRM
C. FILES

SECTION I

The following Progress Report will cover the month of March, 1950 and will be submitted in the same form as that submitted for the month of February. Where contract schedule numbers have been omitted, item affected are either complete or require no comment. See Section II for drawing list and progress percentages.

Item 1 (25,000 KVA Power Transformers)

a) Awaiting manufacturers' nameplate data and wiring diagram drawing for main transformer.

b) Burns and Roe preparing a sketch showing arrangement of cable termination on the low voltage 13.8 KV side of main transformer. Available week of April 10th. It is requested that this arrangement be coordinated by General Electric Company with their main transformer.

Item 2 (Primary and Secondary Coolers)

a) Require comments from Foster Wheeler on arrangement of platforms andinstallation of vents with respect to clearing walkways.

Item 3 (Exhauster System With Motors)

a) Unchecked drawing showing right hand second stage exhauster has been received from Roots Connersville. Awaiting final check drawing for this exhauster as well as final check drawing for the left hand exhauster. Burns and Roe have made certain assumptions in laying out the left hand exhauster because no drawings have been submitted.

b) Please request Roots-Connersville to tabulate auxiliaries, with hp requirements for exhausters.

c) Awaiting comments from Roots-Connersville on sketch submitted on discharge recovery pieces.

d) Please request Roots-Connersville to submit outline drawings for motor air coolers.

Item 4 (Compressor System With Motors)

a) Please request Elliott to tabulate auxiliaries, with hp requirements for compressors.

b) Please request Elliott to tabulate auxiliaries, with hp requirements for compressors.

Item 8 (Two C.W. Pumps With Motors)

a) Control scheme for 700 and 150 hp pumps has been approved as originally submitted. The control scheme is being prepared for submission as supplementary information to Westinghouse for inclusion in their Contract NA3-1056.

b) Outline drawings have just been received showing final location of bearing temperature relays for the pumps.

Item 11 (Pressure Control Stations)

a) Received hydraulic flow diagram from Askania Company about March 17th.

Item 11 (Continued)

b) We still require wiring diagrams, oil pump drawings, regulator drawings and tank drawings. See our letter of March 30th requesting this information.

c) Information submitted seems to be adequate for design of 1st Stage Combustion Air Piping, however, it is inadequate for design of control drawings.

d) Study is being made of access walkways to operating cylinders on exhaust gas control valve. Sketch of this study will be sent to NACA for submission to Henry Pratt Company for comments.

Item 14 (Altitude Test Chamber)

a) Burns and Roe checking interferences at front thrust platform supports.

b) Sketch sent to NACA showing arrangement and construction procedure for locking device on main hatch of test section.

Item 16 (Inter and After Coolers - Spec. Items 1,3 and 7)

a) The majority of Griscom-Russell drawings have been received and returned with comments.

Item 18 (Shop and Access Building) -

a) Proposed Changed Order for minor revisions will be submitted shortly.

b) NACA have not completed their study of Cardox System in the area.

c) Require shop drawings for control cubicle outline and wiring drawings. These drawings actually refer to the hatch cover control for the Altitude Test Chamber.

Item 19 (Fuel Storage Tanks)

a) NACA are to issue Change Order to provide a bitumastic coating under fuel tanks. NACA to make tests following installation of tanks to determine number and location of anodes to be provided for cathodic protection.

Item 23B. (Transformer and Motor Control Center - H.P.F.P.H.)

a) Shop drawings required on transformer and motor control center switchgear. It is important that the outline drawings for the switchgear be received so that under floor conduits may be rearranged on the Shop and Access Building Equipment Room Electrical drawings.

Item 23C. (Switchgear - Water Treatment Area) - New Item

a) Specifications will be prepared for this switchgear as soon as requirements have been determined. Scheduled for approval submission on April 24th.

Item 24 (Gas Fired Air Heaters)

a) Location of centerline of air heaters has been established as 16' west of Equipment Building columns centerline. This determination has been established on a basis of space required for tieline interconnection. Sketch showing arrangement of piping location was forwarded to NACA on April 3rd.

b) Burns and Roe have been working closely with Petro Chem. in establishing location of inlet and outlet flanges as well as allowable thrusts.

c) Petro Chem drawings showing loading diagrams and foundation requirements have been received.

d) No information has been received relative to control panel boards, requirements for electrical connections, natural gas piping, instrumentation, etc. as outlined in Item 24 (d) of last Progress Report.

Item 25 (Exhaust Gas Duct System)

a) Drawing has been revised to accommodate expansion joints and exhaust control valves.

b) Awaiting letter from NACA as required to change drawings to accommodate new type spray ring as per sketch transmitted previously.

c) Carter general arrangement drawings have been received and returned. No other drawings submitted.

d) A bypass from the discharge of the expander turbine to the 13' diameter exhaust duct has been designed. The exhaust gas duct is of carbon steel. There is some question as to whether or not the minus 70° air will be tempered with hot gases in the exhaust gas ducts as the entire duct system had been designed for a minimum temperature of minus 30°.

Item 26 (Two 48" Motor Operated Gate Valves)

a) Shop drawings of valve and wiring diagrams for motor operators have been received from Chapman Valve Company.

b) NACA please advise whether local and remote control devices are to be furnished separate. This may be done as a supplement to the Primary Electrical Contract, Item 33.

Item 27 (Variable Frequency Starting and Exciting Equipment)

a) Outline drawings showing the foundation requirements for the Variable Frequency M-G Sets have been returned to NACA.

b) Outline drawing for motor generator exciter received from NACA, however no copies have been received from Elliott Company for this unit. Burns and Roe are holding NACA's copy until receipt of certified drawings.

c) The following additional shop drawings are required:

1. Outline dimensions of slip regulator including sump pit requirements and heat exchanger outline. It is understood that Elliott Company is completing their thermal requirements and is transmitting this information to Westinghouse for design of slip regulator.

2. List of auxiliaries and hp requirements associated with slip regulator including wiring diagrams.

Item 29 (Combustion Air Piping System)

a) Final drawings and specifications scheduled for release to NACA on April 7th.

b) Arrangement of Pressure Reducing Valves has been shown in accordance with Askania's suggestions to accommodate control equipment.

Item 30 (Circulating Water Piping System)

a) Specifications C-1701 issued to vendors. Burns and Roe made revisions on tracings and new sepia for Addendum. Awaiting receipt of bids.

b) After installation of Circulating Water Piping System, NACA will take field tests to determine number and location of anodes required to provide Cathodic Protection.

Item 31 (Fuel Piping System)

a) Final specifications and Sepia tracings forwarded to NACA on March 31st. All comments resulting from recent Conference have been taken into account on the final tracings.

b) After installation of Fuel Piping System, NACA will take field tests to determine number and location of anodes required to provide Cathodic Protection.

Item 32 (P.H., Exhaust Gas Stack, Pipe Supports & Tank Foundations)

a) Proposed Change Order No. 20 covering revision to C. W. Pump House to suit water treatment section, design of Combustion Air header trench, and certain other minor revisions to this contract was sent to NACA together with Sepias and revised drawings on March 31st.

Item 32A. (H.P. Fuel Pump House)

a) Draft of specifications and final sepias on H. P. Pump House sent to NACA on March 31st.

Item 33 (Primary Electrical Work - 1st Step Construction)

a) Revising drawings incorporating suggestions and comments submitted by NACA. Final sepia tracings for this item will be mailed April 7th.

b) Fuel distribution controls covering emergency shut down and CO_2 system shut down will not be covered on the April 7th tracing. This information is being prepared and will be added to the drawings during the period when the specifications are out for bid. This may require issuance of an Addendum incorporating these additions.

Item 35 (Walkways and Stairways - Altitude Chamber & Coolers)

a) Awaiting comments from NACA on drawings showing platforms to Altitude Test Chamber, coolers, and exhaust ducts. It is believed that NACA is awaiting comments from Foster Wheeler.

b) See Item 11 (d).

c) Due to lack of pertinent information and also due to the fact that this is a relatively small contract, Burns and Roe have tentatively scheduled completion of their work on this contract for May 15, 1950.

Item 37 (Thrust Platform and Thrust Transmitting Device)

a) Burns and Roe has submitted final information and sepia tracingsto NACA for issuance to bidders.

Item 38)(Panel Boards - Shop and Access Bldg)
Item 39)(Control and Instrumentation Piping - 1st Step)

Insufficient information is available to permit design of this work.

Item 40 (Water Treatment System - General)

a) Burns and Roe has been advised by Mr. Knedler of Sheppard T. Powell Company that Shutte Koerting will have information available on water ejection for the vacuum deaerator soon. This will mean that some adjustments will have to be made in the internal pressures of the two (2) sections on the deaerator.

b) A wet salt storage pit has been decided upon as a source of brine and its location generally has been decided. This will be discussed with NACA.

c) It has not definitely been determined whether it will be practical to award revised booster pump pit, foundations for vacuum deaerator, and other miscellaneous concrete and structural work as an addendum to the Hansen contract or as a separate contract.

Item 40A. (Zeolite Softening and Chlorination System)

a) Approval specifications for the Zeolite Softening equipment is scheduled for April 7. Along with this specification will be the flow diagram and piping arrangement which may be submitted to the vendors along with the specification as reference.

Item 40B. (Mixed Flow Booster Pumps)

a) Studies are being made to determine pit requirements and data is being assembled to determine pump characteristics. Space allocation is also being studied. These pump specifications are scheduled for approval release on April 20th.

b) As soon as requirements are determined, electrical specifications will be prepared covering the switchgear. (This work has been identified as Item 23C.)

Item 40C. (Vacuum Deaerator System)

a) Preliminary designs are being made to determine the overall height and internals of the vacuum deaerators. These have been submitted to NACA and Sheppard T. Powell for comments.

b) From the design work completed to-date, it is evident that the height of the vacuum deaerators will be approximately 75' above grade.

Item 40D. (Piping System - Water Treatment Equipment - Small Piping - Water Treating)

a) Final design for piping arrangement and flow diagrams are proceeding.

b) It may be practical to purchase the Chlorination equipment as part of the Piping Contract.

Item 42 (Duel Metering Equipment)

a) It is our understanding that NACA is preparing specification for purchase of this equipment.

Item 43 (Fuel Pressure Control System)

a) Bids received and are being reviewed. Comments will be forwarded to NACA on April 5th.

Item 44A. (Gasoline Drainage Pumps)

a) Awaiting drawings on P.O. C-35251 - Strong Carlisle and Hammond for Gasoline Drainage Pumps.

Item 45 (2-48" Combustion Air Valves - Butterfly)

a) Shop drawings showing outline of valve motor operator, etc. have been received from Henry Pratt.

Drawing also received showing control circuit for the motor. Only one (1) set of prints received, require two (2) additional prints to return to NACA.

b) NACA to advise whether local and remote control devices are to be furnished separate from this contract. These devices may be included in an Addendum to the Primary Electrical Contractor (Item 33).

Item 45A. (2-48" Butterfly Valves - Pressure Control)

a) Burns and Roe will write specification for these valves so that same may be purchased and installed in the first stage of the Combustion Air System.

Item 48 (Expansion Joints - Combustion Air System)

a) Expansion joint specifications sent to NACA on February 6th for approval will be revised to agree with the final piping system which has now been decided upon. This specification will be issued with the final drawings for the piping on April 7th.

Item 50 (Fire Protection - 1st Step)

a) Awaiting final specification now being prepared by the NACA.

Items 51 and 52 (Equipment Bldg. SubStructure and Foundations)
(Equipment Building SuperStructure & Bldg. Serv.)

a) Contract drawings for bid purposes have been made for foundations, compressors, 1st Stage Exhauster and 2nd Stage Exhauster.

b) Outline drawings and loading diagrams and other information required for final design of foundations and layout for the following:

1. Check drawings for right hand and left hand second stage exhauster.

2. Slip regulator and exciter for starting M-G set.

3. Expander Turbine.

4. Switchgear, control panels, exciters.

5. Refrigeration and air drying equipment. (NACA preparing tentative specification.

6. Auxiliary 2300V transformer and induction regulators. It is important that we get outline drawings for these units, showing centerline to centerline spacing between units. Design is proceeding on a basis of approximately 4' spacing between transformer and regulator. It is understood that Westinghouse are providing a throat connection between the transformers and the regulators.

c) Final Architectural and Structural drawings are progressing based on decisions previously agreed upon and as modified through periodic discussions with Mr. N. P. Miller. Where final information is lacking the design is progressing based on preliminary information or suppositions in order to meet the May 1st bidding date. Where such information is found to be erroneous corrections will be necessary after the bidding date.

d) Heating and Ventilating design is progressing on a basis of nine air changes per hour. The arrangement of ducts, filters, etc. have been established. Detail piping and final location of units are being made.

Items 51 and 52 (Continued)

e) Building lighting is progressing based on agreement reached with Mr. Haas in recent New York Conference. Incandescent lighting will be used for operating floor, basement floor and basement mezzanine. Fluorescent lighting will be used in the control room.

f) Refer to Section II of this report for detail progress of drawings.

Item 53 (Primary Electrical Work - Equipment Building Area)

a) Preliminary study drawings showing location of various motor control center units, substation power and lighting units, switchgear and exciters in progress. One line diagram showing complete auxiliaries, hp requirements in equipment building in preparation. These preliminary drawings will be available week of April 17th.

b) Sleeves and floor slots which will be required in the Equipment Building but which cannot be determine at this time will be indicated in their approximate locations where possible and the specifications for the Equipment Building so arranged that additional openings can be contracted for on a unit price basis.

Item 54 (Air and Gas Piping - Equipment Building and Air Heaters)

a) Drawings showing location of expansion joints and anchor points for the Exhaust System and Compressor System have been submitted to NACA for comments. Piping system for future exhauster and future compressor are being developed and will be submitted during the week of April 10th.

b) Information relative to bleed piping on both the exhausters and compressors is very important since it may affect the layout or arrangement of this piping.

c) Piping line to air heaters and to header pit has been developed and forwarded to NACA for comment.

d) Piping connections have been left for air drying and refrigeration system. At the present the location of these connections is rather indeterminate.

Item 55 (General Service Piping - Equipment Building Area)

a) Design of continuation of C. W. System, Trench, etc. outside of building is being developed. Main piping to be awarded under this Contract within the building is being studied and tentative locations for headers agreed upon. Lube Oil Piping is being considered.

Item 56 (Air Drying and Refrigeration)

a) NACA are preparing tentative specifications for Burns and Roe and equipment manufacturers' comments. These specifications are to be available immediately.

Item 56A. (Expander Turbine)

No additional information has been received on this Item. Burns and Roe require physical dimensions of proposed unit. Foundations and piping connection units are now indeterminent.

Items 58 and 59 (Compressor System - Controls)
(Exhaust System - Controls)

Burns and Roe are awaiting proposal information for compressor and exhauster system controls. This information will directly tie in with the bleeder piping as stated previously. Bleeder Piping - sizes, location, etc. must be determined immediately.

Item 60 (Check Valves - Exh. and Compressor Systems)

Specifications forwarded to NACA on March 31st.

Item 61 (Butterfly Valves - Exh. Gas System)

Specifications forwarded to NACA on March 31st.

Item 62 (Rubber Expansion Joints at Machines)

Specifications scheduled for release to NACA on April 10th.

Item 62A. (Exp. Joints for Combustion Air System)

Specifications scheduled for release to NACA on April 24th.

Item 63 (Combustion Air System)

Specifications scheduled for release to NACA on April 17th.

Item 65 (Lube Oil System)

a) Outline of proposed system based on quantities originally submitted by vendors, submitted to NACA for comments on April 4th. Recent information from manufacturers has increased quantities. Information relative to pressures and flows requested in Burns and Roe's letter of April 4th.

b) The location of the Lube Oil Room is being studied with thought being given to utilizing the space on the North side of building between exhauster inlets.

Item 66 (Building Cranes)

a) Specifications issued to NACA on March 31st.

b) Crane capacities are based on equipment weights for Phase I construction. It is noted that the future compressor may be driven by a motor of approximately 23,000 hp. The rotor weight of this unit may exceed the safe loading of the 25 ton crane. We would like to have NACA comment relative to the possible future conditions which may exist.

Item 67 (Exh. and Compressor Control Panels)

These panels cannot be developed until adequate information is available on exhauster and compressor control systems. Approximate locations of panels have been established.

Item 70 (Misc. Elec. Equipment - Equipment Building Area)

a) One Line drawing showing of equipment and electrical facilities for Equipment Building Area in preparation. Completion of this drawing listing all known hp requirements will allow preparation of specification for unit substation and motor control centers.

b) Preliminary one line drawing will be released for comments the week of April 10th.

Item 72 (Swgr. Control Equip. Trans. & Aux. - Comp. & Exh. Motors)

No drawings have been received to-date from Westinghouse for starting switchgear, running switchgear, 2300V auxiliary transformer, and regulators. It is important that outline drawings be expedited so that outdoor substation arrangement can be completed and electrical bay switchgear cable termination established.

Item 73 (34.5 KV Cable Installation)

Specifications and drawings to be released April 7th for final approval.

Item 75 (Substation "B" and "G" Struc. and Equipment)

Specifications and drawings to be released the week of April 10th for final approval and comments.

SECTION II - See Section II for progress of Contract Drawings.

SECTION II

The following items contain the estimated percentage completion of drawings or in the case of work being issued for contract at this time, its status. Other work on which preliminary drawing lists have been prepared but where design is not acute have been listed withou percentages. Unless otherwise noted the percentage given is in respect to the final finished drawing.

ITEM 29 - COMBUSTION AIR PIPING (1st Step)

Final Sepia tracings being forwarded to NACA on April 7th.

ITEM 32A. - HIGH PRESSURE FUEL PUMP HOUSE AND SEPARATOR PIT

Final Sepia tracings sent to NACA on March 31st.

ITEM 33 - PRIMARY ELECTRICAL WORK (1st Step)

Final sepia tracings to be forwarded to NACA on April 10th.

ITEM 36 - PLATFORMS, WALKWAYS AND STAIRWAYS

		Nos. 31 and 32	Nos. 33 and 34
Structural			
CE-104540 (4310)	Walkways and Stairways - Test Chamber & Pri. Coolers, Elev. and Sections	95	95
CE-104541 (4311)	Walkways & Stairways Test Chamber & Pri. Coolers, Sections and Details	95	95

Reference Drawings - To be assigned later.

ITEM 39 - CONT. AND INSTRUMENTATION PIPING (1st Step)

CE-104509	Control Piping, Plans, Elev. and Details
CE-104510	Control Piping - Sections & Details

Reference Drawings - To be assigned later.

ITEMS 51 AND 52 - EQUIPMENT BUILDING (CE-104700 to CE-104734)

Percentages indicated are as apply to drawings for bidding purposes only and do not necessarily indicate percent of complete drawing.

Architectural (CE-104700 to CE-104734)		Nos. 31 and 32	Nos. 33 and 34
CE-104700 (4701)	Plot Plan	3%	15%
CE-104701 (4702)	Basement Plan	0	12
CE-104702 (4703)	Operating Floor Plan	25	55

Architectural (Continued)		Nos. 31 and 32	Nos. 33 and 34
CE-104703 (4704)	Roof Plan	2	70
CE-104704 (4705)	Control Room & Elec. Mezzanine Plans and Sections	5	65
CE-104705 (4707)	Control Room Details	0	50
CE-104706 (4708)	North Elevation	40	60
CE-104707 (4709)	South Elevation - Wall Sections and Details - Sound Retarding Vert. Lift Door Details	40	55
CE-104708 (4710)	East Elevation	40	55
CE-104709 (4711)	West Elev - Wall Sections and Details	40	60
CE-104710 (4712)	Transverse Section	0	55
CE-104711 (4713)	Longitudinal Section	20	70
CE-104712 (4714)	Typical Wall & Window Details Sheet 1	5	45
CE-104713 (4715)	Typical Wall & Window Details Sheet 2	0	0
CE-104714 (4716)	Typical & Special Door Details	0	5
CE-104715 (4717)	Entrance Details	0	10
CE-104716 (4718)	Toilet & Locker Room Details	0	10
CE-104717 (4719)	Stair & Railing Details - Plans Sheet 1	5	10
CE-104718 (4720)	Stair & Railing Details - Plans Sheet 2	0	10
CE-104719 (4721)	Misc. & Spec. Details - Sht. 1	4	10
CE-104720 (4722)	Misc. & Spec. Details - Sht. 2	4	10
CE-104721 (4723)	Cold & Hot Water Piping Plans	0	5
CE-104722 (4724)	Cold & Hot Water Piping Sections	0	5
CE-104723 (4725)	Sanitary & Storm Sewer Piping - Plans	0	5
CE-104724 (4726)	Sanitary & Storm Sewer Piping Sections	0	5
CE-104725 (4727)	Schedules, Windows, Doors, Hardware Finish	0	5

Structural (CE-104735 to CE-104769)

Superstructure

CE-104735 (4731)	Roof Framing Plan - Sections and Details	20	95
CE-104736 (4732)	Roof Trusses, Cols., On Line 4, Bracing and Details	10	50
CE-104737 (4733)	Col. Schedule and Details	0	65
CE-104738 (4734)	Elec. Mezz. & Control Room Floor Framing - Sections and Details	0	75
CE-104739 (4735)	Operating Floor Framing Plans - Sections and Details	5	85

		Nos. 31 and 32	Nos. 33 and 34
Superstructure (Continued)			
CE-104740 (4736)	Crane Girders and Details	10	95
CE-104741 (4737)	Col. Line Elev. - East & West Walls	0	95
CE-104742 (4738)	Col. Line Elev. - North & South Walls	0	80
CE-104743 (4739)	Lower Chord Bracing and Details	0	0
Substructure and Foundations			
CE-104746 (4746)	Building Foundation - Plan, Sections and Details	0	75
CE-104747 (4747)	Building Foundation Details	0	55
CE-104748 (4748)	Basement Floor Plan, Outside Ramp and Steps - Sections and Details	0	50
CE-104749 (4749)	Conc. Encl. for Air Intake & Exh. Pipe	0	70
CE-104750 (4750)	Compressor Foundation - Sheet 1	40	95
CE-104751 (4751)	Compressor Foundation - Sheet 2	10	95
CE-104752 (4752)	Compressor Foundation - Sheet 3	0	0
CE-104753 (4753)	1st Stage Exh. Found. - Sheet 1	50	95
CE-104754 (4754)	1st Stage Exh. Found. - Sheet 2	0	95
CE-104755 (4755)	2nd Stage Exh. Found. - Sheet 1	10	30
CE-104756 (4756)	2nd Stage Exh. Found. - Sheet 2	0	0
CE-104757 (4757)	2nd Stage Exh. Found. - Sheet 3	0	0
CE-104758 (4759)	Misc. Equipment Foundations	0	0
CE-104759 (4770)	Air Heater Foundations	0	10
CE-104760 (4771)	Transformer Foundations - Sht. 1	0	20
CE-104761 (4772)	Transformer Foundations - Sht. 2	0	0
CE-104762 (4773)	Refrig. Equip. Found. - Sheet 1	0	0
CE-104763 (4774)	Refrig. Equip. Found. - Sheet 2	0	0
Electrical (CE-104758 to CE-104799)			
CE-104785 (3701)	Lighting Plan - Basement Floor	0	50
CE-104786 (3702)	Lighting Plan - Operating Floor	0	60
CE-104787 (3703)	Lighting Plan - Mezz. & Control Room	0	20
CE-104788 (3704)	Lighting Details & Fixture Schedule	0	10
CE-104789 (3705)	Outside Lighting - Plans & Details	0	0
CE-104790 (3706)	Grounding Plan	0	0
CE-104791 (3707)	Underground Duct Lines & Manhole Details - Sheet 1	0	15
CE-104792 (3708)	Underground Duct Lines & Manhole Details - Sheet 2	0	20
Mechanical (CE-104770 to CE-104784)			
CE-104770 (2709)	Heating and Vent. System - Operating Floor - Roof and Control Room Plans	10	70
CE-104771 (2710)	Heating and Vent. System - Basement Plan	10	60
CE-104772 (2711)	Heating and Vent. System - Elevs.	10	50
CE-104773 (2713)	Building Service - Steam and Condensate	0	30

Reference Drawings		Nos. 31 and 32	Nos. 33 and 34
CE-104779 (2701)	General Arrangement Plan Operating Floor & Control Room	15	45
CE-104780 (2702)	General Arrangement Plan Basement and Mezzanine	12	45
CE-104781 (2703)	General Arrangement Cross Sections Looking North	12	40
CE-104782 (2704)	General Arrangement Cross Sections Looking North	0	10
CE-104783 (2705)	General Arrangement - Longitudinal Sections	7	30
CE-104784 (2706)	General Arrangement - Longitudinal Sections	5	30

ITEM 53 - PRIMARY ELECTRICAL WORK - EQUIPMENT BUILDING AREA

3715 Main One Line Diagram - Sheet 1
3716 Main One Line Diagram - Sheet 2
3717 Auxiliary One Line Diagram - Sheet 1
3718 Auxiliary One Line Diagram - Sheet 2
3719 Interconnection Wiring Diagram - Sheet 1
3720 Interconnection Wiring Diagram - Sheet 2
3721 Annunciator Schematic Diagram
3722 Wiring Diagram - Sheet 1
3723 Wiring Diagram - Sheet 2
3724 Wiring Diagram - Sheet 3
3725 Wiring Diagram - Sheet 4
3726 Wiring Diagram - Sheet 5
3727 Wiring Diagram - Sheet 6
3728 Conduit Plan - Basement Floor - Sheet 1
3729 Conduit Plan - Basement Floor - Sheet 2
3730 Conduit Plan - Operating Floor - Sheet 1
3731 Conduit Plan - Operating Floor - Sheet 2
3732 Conduit Plan - Gas Fired Air Heaters
3733 Conduit Details - Sheet 1
3734 Conduit Details - Sheet 2
3735 Conduit Details - Sheet 3
3736 13.8 KV Motor Leads - Details - Sheet 1
3737 13.8 KV Motor Leads - Details - Sheet 2
3738 Telephone & Signal System - Basement Floor
3739 Telephone & Signal System - Operating Floor
3740 Telephone & Signal System - Elevations & Details
3741 Riser Diagrams & Schedules - Sheet 1
3742 Riser Diagrams & Schedules - Sheet 2

Reference drawings - To be assigned later.

ITEM 54 - AIR AND GAS PIPING - EQUIPMENT BLDG. AND AIR HEATERS

		Nos. 31 and 32	Nos. 33 and 34
Mechanical			
2716	Equipment Bldg. & Air Heater Area Combustion Air & Gas Piping - Plan	50	70
2717	Equip. Bldg. & Air Heater Area Combustion Air & Gas Piping - Cross Sections	35	50
2718	Equipment Bldg. & Air Heater Area Combustion Air & Gas Piping - Cross Sections	5	10
2719	Equipment Bldg. & Air Heater Area Combustion Air & Gas Piping - Longidudinal Sections	20	40
2720	Equipment Bldg. & Air Heater Area Combustion Air & Gas Piping - Longidudinal Sections	20	60
2721	Equipment Bldg. & Air Heater Area Misc. Elevations and Details	0	0
Structural			
4761	Exhaust Gas Ducts - Details	50	65
4762	Exhaust Gas Ducts - Details	40	50
4763	Combustion Air Piping - Details	40	40
Reference Drawings			
CE-104779 (2701)	General Arrangement Plan Operating Floor and Control Room	15	45
CE-104780 (2702)	General Arrangement Plan Basement and Mezzanine	12	45
CE-104781 (2703)	General Arrangement Cross Sections Looking North	12	40
CE-104782 (2704)	General Arrangement Cross Sections Looking North	0	10
CE-104783 (2705)	General Arrangement - Longitudinal Sections	7	30
CE-104784 (2706)	General Arrangement - Longitudinal Sections	5	30

40C. VACUUM DEAERATION SYSTEM

Mechanical			
2457	Flow Diagram - Water Treatment and Deaeration System	0	60
2450	General Arrangement - Deaerating Tanks	0	60
2451	Deaerating Tanks - Details and Internals	0	40
2452	Deaerating System - C.W. Piping - Plans and Details	0	30

		Nos. 31 and 32	Nos. 33 and 34
Structural			
	Deaerating Tanks - Structural Steel Supports - Plans & Elev.	0	10
	Deaerating Tanks - Structural Steel Supports - Sections and Details	0	0

Reference Drawings - To be assigned later.

40D. - PIPING - WATER TREATMENT SYSTEM

Mechanical

2457	Flow Diagram - Water Treatment and Deaeration System	0	60
2459	Water Softening System - Plans and Sections	0	70
2458	Water Treatment System - Minor Area Piping	0	25

Reference Drawings - To be assigned later.

ITEM 55 - GEN. SERV. PIPING - EQUIPMENT BUILDING AREA

Mechanical

2731	Circulating Water Piping Plan
2732	Circulating Water Piping Elevations
2733	Circulating Water Piping Sections
2734	Circulating Water Piping Details
2735	Utility Compressed Air Piping - Plan
2736	Utility Compressed Air Piping - Elevations and Sections
2737	Intercooler Drain Piping
2738	Lubricating Oil Piping - Plan
2739	Lubricating Oil Piping - Elevations and Sections

Reference Drawings - To be assigned later.

ITEM 56 - REFRIGERATION EQUIPMENT AND PIPING

Mechanical

2741	General Arrgt. Plan of Refrigeration and Drying System
2742	Gen. Arrgt. Elevations of Refrigeration and Drying System
2743	Gen. Arrgt. Sections of Refrigeration and Drying System

Reference Drawings - To be assigned later.

ITEM 68A. - CONTROL AND INSTRUMENTATION PIPING - EQUIPMENT BLDG. AREA

Mechanical

2751	Instrument Lists
2752	Instrument Lists
2753	Instrument Piping - Plan
2754	Instrument Piping - Elevations and Details
2755	Control Air Piping - Plan
2756	Control Air Piping - Elev. and Details
2757	Hydraulic Valve - Oil Piping - Plan
2758	Hydraulic Valve - Oil Piping - Details

ITEM 75 - SUBSTATION "B" & "G" - STRUCTURE & EQUIPMENT

Electrical

3606	Substation "G" Plan, Elevations and Sections (Existing and New Bays)
3602	Substation "B" Plan, Elevations and Sections (Bays 1, 2, 6 and 7)

Structural

4601	Substation "G" Reactor Foundations and Manholes

Reference drawing - To be assigned later.

ITEM 73 - 34.5 KV CABLE INSTALLATION

These drawings have been completed and were forwarded to NACA on April 6th for final approval and comments.

ITEM 76 - PRIMARY ELECTRICAL WORK - SUBSTATION AREA

Electrical

3601	Substation "A" Wiring Diagrams, Control, Relaying and Alarms
3604	Substation "B" Wiring Diagrams, Control, Relaying and Alarms
3605	Substation "G" Arrangement Plan Including Lighting and Grounding One Line Diagram
3608	Substation "G" Wiring Diagrams Control, Relaying and Alarms
3609	Substation "G" Conduit Plan
3610	Underground Ductlines (34.5 KV) 2nd Step Construction
3612	Substation "B" Arrangement Plan Including Grounding and One Line Diagram

Reference Drawings - To be assigned later.

Progress

The percentages listed below are estimated to be the completion status of the Project as of April 1st, 1950.

	Nos. 31 and 32	Nos. 33 and 34
1. Operations Building	100	100
Amendment #1	100	100
Amendment #2	100	100
2. Altitude Test Chambers	99	99
3. Shop and Access Building	98	99
4. Test Air Piping	94	96
Amendment #3	100	100
5. Cooling Tower & C. W. System	95	95
6. Fuel Storage and Distribution System	93	95
7. Electrical Substations	30	45
8. Equipment Building and Equipment	30	40

DRMcConathy/KBH/RDK/LHR/id

DRMc Conathy

PROGRESS REPORTS NO. 33 AND 34

32015

Subject: National Advisory Committee for Aeronautics
Propulsion Science Research Laboratory
Project No. 794 (NAw-5652) - B&R W.O. #1218

April 6, 1950

cc: NACA-4
EJT

RCR
RFC
WAB
KAR
WLG-3
RRB-2
FN
PJM
JBM
AAV-4
KBH-3
WGC-3
RDK-3
LHR-4
GHT
DRM
C. FILES

SECTION I

The following Progress Report will cover the month of March, 1950 and will be submitted in the same form as that submitted for the month of February. Where contract schedule numbers have been omitted, item affected are either complete or require no comment. See Section II for drawing list and progress percentages.

Item 1 (25,000 KVA Power Transformers)

a) Awaiting manufacturers' nameplate data and wiring diagram drawing for main transformer.

b) Burns and Roe preparing a sketch showing arrangement of cable termination on the low voltage 13.8 KV side of main transformer. Available week of April 10th. It is requested that this arrangement be coordinated by General Electric Company with their main transformer.

Item 2 (Primary and Secondary Coolers)

a) Require comments from Foster Wheeler on arrangement of platforms and installation of vents with respect to clearing walkways.

Item 3 (Exhauster System With Motors)

a) Unchecked drawing showing right hand second stage exhauster has been received from Roots Connersville. Awaiting final check drawing for this exhauster as well as final check drawing for the left hand exhauster. Burns and Roe have made certain assumptions in laying out the left hand exhauster because no drawings have been submitted.

b) Please request Roots-Connersville to tabulate auxiliaries, with hp requirements for exhausters.

c) Awaiting comments from Roots-Connersville on sketch submitted on discharge recovery pieces.

d) Please request Roots-Connersville to submit outline drawings for motor air coolers.

Item 4 (Compressor System With Motors)

a) Please request Elliott to tabulate auxiliaries, with hp requirements for compressors.

b) Please request Elliott to tabulate auxiliaries, with hp requirements for compressors.

Item 8 (Two C.W. Pumps With Motors)

a) Control scheme for 700 and 150 hp pumps has been approved as originally submitted. The control scheme is being prepared for submission as supplementary information to Westinghouse for inclusion in their Contract NA3-1056.

b) Outline drawings have just been received showing final location of bearing temperature relays for the pumps.

Item 11 (Pressure Control Stations)

a) Received hydraulic flow diagram from Askania Company about March 17th.

Item 11 (Continued)

b) We still require wiring diagrams, oil pump drawings, regulator drawings and tank drawings. See our letter of March 30th requesting this information.

c) Information submitted seems to be adequate for design of 1st Stage Combustion Air Piping, however, it is inadequate for design of control drawings.

d) Study is being made of access walkways to operating cylinders on exhaust gas control valve. Sketch of this study will be sent to NACA for submission to Henry Pratt Company for comments.

Item 14 (Altitude Test Chamber)

a) Burns and Roe checking interferences at front thrust platform supports.

b) Sketch sent to NACA showing arrangement and construction procedure for locking device on main hatch of test section.

Item 16 (Inter and After Coolers - Spec. Items 1,3 and 7)

a) The majority of Griscom-Russell drawings have been received and returned with comments.

Item 18 (Shop and Access Building) -

a) Proposed Changed Order for minor revisions will be submitted shortly.

b) NACA have not completed their study of Cardox System in the area.

c) Require shop drawings for control cubicle outline and wiring drawings. These drawings actually refer to the hatch cover control for the Altitude Test Chamber.

Item 19 (Fuel Storage Tanks)

a) NACA are to issue Change Order to provide a bitumastic coating under fuel tanks. NACA to make tests following installation of tanks to determine number and location of anodes to be provided for cathodic protection.

Item 23B. (Transformer and Motor Control Center - H.P.F.P.H.)

a) Shop drawings required on transformer and motor control center switchgear. It is important that the outline drawings for the switchgear be received so that under floor conduits may be rearranged on the Shop and Access Building Equipment Room Electrical drawings.

Item 23C. (Switchgear - Water Treatment Area) - New Item

a) Specifications will be prepared for this switchgear as soon as requirements have been determined. Scheduled for approval submission on April 24th.

Item 24 (Gas Fired Air Heaters)

a) Location of centerline of air heaters has been established as 16' west of Equipment Building columns centerline. This determination has been established on a basis of space required for tieline interconnection. Sketch showing arrangement of piping location was forwarded to NACA on April 3rd.

b) Burns and Roe have been working closely with Petro Chem. in establishing location of inlet and outlet flanges as well as allowable thrusts.

c) Petro Chem drawings showing loading diagrams and foundation requirements have been received.

d) No information has been received relative to control panel boards, requirements for electrical connections, natural gas piping, instrumentation, etc. as outlined in Item 24 (d) of last Progress Report.

Item 25 (Exhaust Gas Duct System)

a) Drawing has been revised to accommodate expansion joints and exhaust control valves.

b) Awaiting letter from NACA as required to change drawings to accommodate new type spray ring as per sketch transmitted previously.

c) Carter general arrangement drawings have been received and returned. No other drawings submitted.

d) A bypass from the discharge of the expander turbine to the 13' diameter exhaust duct has been designed. The exhaust gas duct is of carbon steel. There is some question as to whether or not the minus 70° air will be tempered with hot gases in the exhaust gas ducts as the entire duct system had been designed for a minimum temperature of minus 30°.

Item 26 (Two 48" Motor Operated Gate Valves)

a) Shop drawings of valve and wiring diagrams for motor operators have been received from Chapman Valve Company.

b) NACA please advise whether local and remote control devices are to be furnished separate. This may be done as a supplement to the Primary Electrical Contract, Item 33.

Item 27 (Variable Frequency Starting and Exciting Equipment)

a) Outline drawings showing the foundation requirements for the Variable Frequency M-G Sets have been returned to NACA.

b) Outline drawing for motor generator exciter received from NACA, however no copies have been received from Elliott Company for this unit. Burns and Roe are holding NACA's copy until receipt of certified drawings.

c) The following additional shop drawings are required:

1. Outline dimensions of slip regulator including sump pit requirements and heat exchanger outline. It is understood that Elliott Company is completing their thermal requirements and is transmitting this information to Westinghouse for design of slip regulator.

2. List of auxiliaries and hp requirements associated with slip regulator including wiring diagrams.

Item 29 (Combustion Air Piping System)

a) Final drawings and specifications scheduled for release to NACA on April 7th.

b) Arrangement of Pressure Reducing Valves has been shown in accordance with Askania's suggestions to accommodate control equipment.

Item 30 (Circulating Water Piping System)

a) Specifications C-1701 issued to vendors. Burns and Roe made revisions on tracings and new sepia for Addendum. Awaiting receipt of bids.

b) After installation of Circulating Water Piping System, NACA will take field tests to determine number and location of anodes required to provide Cathodic Protection.

Item 31 (Fuel Piping System)

a) Final specifications and Sepia tracings forwarded to NACA on March 31st. All comments resulting from recent Conference have been taken into account on the final tracings.

b) After installation of Fuel Piping System, NACA will take field tests to determine number and location of anodes required to provide Cathodic Protection.

Item 32 (P.H., Exhaust Gas Stack, Pipe Supports & Tank Foundations)

a) Proposed Change Order No. 20 covering revision to C. W. Pump House to suit water treatment section, design of Combustion Air header trench, and certain other minor revisions to this contract was sent to NACA together with Sepias and revised drawings on March 31st.

Item 32A. (H.P. Fuel Pump House)

a) Draft of specifications and final sepias on H. P. Pump House sent to NACA on March 31st.

Item 33 (Primary Electrical Work - 1st Step Construction)

a) Revising drawings incorporating suggestions and comments submitted by NACA. Final sepia tracings for this item will be mailed April 7th.

b) Fuel distribution controls covering emergency shut down and CO_2 system shut down will not be covered on the April 7th tracing. This information is being prepared and will be added to the drawings during the period when the specifications are out for bid. This may require issuance of an Addendum incorporating these additions.

Item 35 (Walkways and Stairways - Altitude Chamber & Coolers)

a) Awaiting comments from NACA on drawings showing platforms to Altitude Test Chamber, coolers, and exhaust ducts. It is believed that NACA is awaiting comments from Foster Wheeler.

b) See Item 11 (d).

c) Due to lack of pertinent information and also due to the fact that this is a relatively small contract, Burns and Roe have tentatively scheduled completion of their work on this contract for May 15, 1950.

Item 37 (Thrust Platform and Thrust Transmitting Device)

a) Burns and Roe has submitted final information and sepia tracingsto NACA for issuance to bidders.

Item 38)(Panel Boards - Shop and Access Bldg)
Item 39)(Control and Instrumentation Piping - 1st Step)

Insufficient information is available to permit design of this work.

Item 40 (Water Treatment System - General)

a) Burns and Roe has been advised by Mr. Knedler of Sheppard T. Powell Company that Shutte Koerting will have information available on water ejection for the vacuum deaerator soon. This will mean that some adjustments will have to be made in the internal pressures of the two (2) sections on the deaerator.

b) A wet salt storage pit has been decided upon as a source of brine and its location generally has been decided. This will be discussed with NACA.

c) It has not definitely been determined whether it will be practical to award revised booster pump pit, foundations for vacuum deaerator, and other miscellaneous concrete and structural work as an addendum to the Hansen contract or as a separate contract.

Item 40A. (Zeolite Softening and Chlorination System)

a) Approval specifications for the Zeolite Softening equipment is scheduled for April 7. Along with this specification will be the flow diagram and piping arrangement which may be submitted to the vendors along with the specification as reference.

Item 40B. (Mixed Flow Booster Pumps)

a) Studies are being made to determine pit requirements and data is being assembled to determine pump characteristics. Space allocation is also being studied. These pump specifications are scheduled for approval release on April 20th.

b) As soon as requirements are determined, electrical specifications will be prepared covering the switchgear. (This work has been identified as Item 23C.)

Item 40C. (Vacuum Deaerator System)

a) Preliminary designs are being made to determine the overall height and internals of the vacuum deaerators. These have been submitted to NACA and Sheppard T. Powell for comments.

b) From the design work completed to-date, it is evident that the height of the vacuum deaerators will be approximately 75' above grade.

Item 40D. (Piping System - Water Treatment Equipment - Small Piping - Water Treating)

a) Final design for piping arrangement and flow diagrams are proceeding.

b) It may be practical to purchase the Chlorination equipment as part of the Piping Contract.

Item 42 (Duel Metering Equipment)

a) It is our understanding that NACA is preparing specification for purchase of this equipment.

Item 43 (Fuel Pressure Control System)

a) Bids received and are being reviewed. Comments will be forwarded to NACA on April 5th.

Item 44A. (Gasoline Drainage Pumps)

a) Awaiting drawings on P.O. C-35251 - Strong Carlisle and Hammond for Gasoline Drainage Pumps.

Item 45 (2-48" Combustion Air Valves - Butterfly)

a) Shop drawings showing outline of valve motor operator, etc. have been received from Henry Pratt.

Drawing also received showing control circuit for the motor. Only one (1) set of prints received, require two (2) additional prints to return to NACA.

b) NACA to advise whether local and remote control devices are to be furnished separate from this contract. These devices may be included in an Addendum to the Primary Electrical Contractor (Item 33).

Item 45A. (2-48" Butterfly Valves - Pressure Control)

a) Burns and Roe will write specification for these valves so that same may be purchased and installed in the first stage of the Combustion Air System.

Item 48 (Expansion Joints - Combustion Air System)

a) Expansion joint specifications sent to NACA on February 6th for approval will be revised to agree with the final piping system which has now been decided upon. This specification will be issued with the final drawings for the piping on April 7th.

Item 50 (Fire Protection - 1st Step)

a) Awaiting final specification now being prepared by the NACA.

Items 51 and 52 (Equipment Bldg. SubStructure and Foundations)
(Equipment Building SuperStructure & Bldg. Serv.)

a) Contract drawings for bid purposes have been made for foundations, compressors, 1st Stage Exhauster and 2nd Stage Exhauster.

b) Outline drawings and loading diagrams and other information required for final design of foundations and layout for the following:

1. Check drawings for right hand and left hand second stage exhauster.

2. Slip regulator and exciter for starting M-G set.

3. Expander Turbine.

4. Switchgear, control panels, exciters.

5. Refrigeration and air drying equipment. (NACA preparing tentative specification.

6. Auxiliary 2300V transformer and induction regulators. It is important that we get outline drawings for these units, showing centerline to centerline spacing between units. Design is proceeding on a basis of approximately 4' spacing between transformer and regulator. It is understood that Westinghouse are providing a throat connection between the transformers and the regulators.

c) Final Architectural and Structural drawings are progressing based on decisions previously agreed upon and as modified through periodic discussions with Mr. N. P. Miller. Where final information is lacking the design is progressing based on preliminary information or suppositions in order to meet the May 1st bidding date. Where such information is found to be erroneous corrections will be necessary after the bidding date.

d) Heating and Ventilating design is progressing on a basis of nine air changes per hour. The arrangement of ducts, filters, etc. have been established. Detail piping and final location of units are being made.

Items 51 and 52 (Continued)

e) Building lighting is progressing based on agreement reached with Mr. Haas in recent New York Conference. Incandescent lighting will be used for operating floor, basement floor and basement mezzanine. Fluorescent lighting will be used in the control room.

f) Refer to Section II of this report for detail progress of drawings.

Item 53 (Primary Electrical Work - Equipment Building Area)

a) Preliminary study drawings showing location of various motor control center units, substation power and lighting units, switchgear and exciters in progress. One line diagram showing complete auxiliaries, hp requirements in equipment building in preparation. These preliminary drawings will be available week of April 17th.

b) Sleeves and floor slots which will be required in the Equipment Building but which cannot be determine at this time will be indicated in their approximate locations where possible and the specifications for the Equipment Building so arranged that additional openings can be contracted for on a unit price basis.

Item 54 (Air and Gas Piping - Equipment Building and Air Heaters)

a) Drawings showing location of expansion joints and anchor points for the Exhaust System and Compressor System have been submitted to NACA for comments. Piping system for future exhauster and future compressor are being developed and will be submitted during the week of April 10th.

b) Information relative to bleed piping on both the exhausters and compressors is very important since it may affect the layout or arrangement of this piping.

NACA-S-

c) Piping line to air heaters and to header pit has been developed and forwarded to NACA for comment.

d) Piping connections have been left for air drying and refrigeration system. At the present the location of these connections is rather indeterminate.

Item 55 (General Service Piping - Equipment Building Area)

a) Design of continuation of C. W. System, Trench, etc. outside of building is being developed. Main piping to be awarded under this Contract within the building is being studied and tentative locations for headers agreed upon. Lube Oil Piping is being considered.

Item 56 (Air Drying and Refrigeration)

a) NACA are preparing tentative specifications for Burns and Roe and equipment manufacturers' comments. These specifications are to be available immediately.

Item 56A. (Expander Turbine)

No additional information has been received on this Item. Burns and Roe require physical dimensions of proposed unit. Foundations and piping connection units are now indeterminent.

Items 58 and 59 (Compressor System - Controls)
(Exhaust System - Controls)

Burns and Roe are awaiting proposal information for compressor and exhauster system controls. This information will directly tie in with the bleeder piping as stated previously. Bleeder Piping - sizes, location, etc. must be determined immediately.

Item 60 (Check Valves - Exh. and Compressor Systems)

Specifications forwarded to NACA on March 31st.

Item 61 (Butterfly Valves - Exh. Gas System)

Specifications forwarded to NACA on March 31st.

Item 62 (Rubber Expansion Joints at Machines)

Specifications scheduled for release to NACA on April 10th.

Item 62A. (Exp. Joints for Combustion Air System)

Specifications scheduled for release to NACA on April 24th.

Item 63 (Combustion Air System)

Specifications scheduled for release to NACA on April 17th.

Item 65 (Lube Oil System)

a) Outline of proposed system based on quantities originally submitted by vendors, submitted to NACA for comments on April 4th. Recent information from manufacturers has increased quantities. Information relative to pressures and flows requested in Burns and Roe's letter of April 4th.

b) The location of the Lube Oil Room is being studied with thought being given to utilizing the space on the North side of building between exhauster inlets.

Item 66 (Building Cranes)

a) Specifications issued to NACA on March 31st.

b) Crane capacities are based on equipment weights for Phase I construction. It is noted that the future compressor may be driven by a motor of approximately 23,000 hp. The rotor weight of this unit may exceed the safe loading of the 25 ton crane. We would like to have NACA comment relative to the possible future conditions which may exist.

Item 67 (Exh. and Compressor Control Panels)

These panels cannot be developed until adequate information is available on exhauster and compressor control systems. Approximate locations of panels have been established.

Item 70 (Misc. Elec. Equipment - Equipment Building Area)

a) One Line drawing showing of equipment and electrical facilities for Equipment Building Area in preparation. Completion of this drawing listing all known hp requirements will allow preparation of specification for unit substation and motor control centers.

b) Preliminary one line drawing will be released for comments the week of April 10th.

Item 72 (Swgr. Control Equip. Trans. & Aux. - Comp. & Exh. Motors)

No drawings have been received to-date from Westinghouse for starting switchgear, running switchgear, 2300V auxiliary transformer, and regulators. It is important that outline drawings be expedited so that outdoor substation arrangement can be completed and electrical bay switchgear cable termination established.

Item 73 (34.5 KV Cable Installation)

Specifications and drawings to be released April 7th for final approval.

Item 75 (Substation "B" and "G" Struc. and Equipment)

Specifications and drawings to be released the week of April 10th for final approval and comments.

SECTION II - See Section II for progress of Contract Drawings.

SECTION II

The following items contain the estimated percentage completion of drawings or in the case of work being issued for contract at this time, its status. Other work on which preliminary drawing lists have been prepared but where design is not acute have been listed withou percentages. Unless otherwise noted the percentage given is in respect to the final finished drawing.

ITEM 29 - COMBUSTION AIR PIPING (1st Step)

Final Sepia tracings being forwarded to NACA on April 7th.

ITEM 32A. - HIGH PRESSURE FUEL PUMP HOUSE AND SEPARATOR PIT

Final Sepia tracings sent to NACA on March 31st.

ITEM 33 - PRIMARY ELECTRICAL WORK (1st Step)

Final sepia tracings to be forwarded to NACA on April 10th.

ITEM 36 - PLATFORMS, WALKWAYS AND STAIRWAYS		Nos. 31 and 32	Nos. 33 and 34
Structural			
CE-104540 (4310)	Walkways and Stairways - Test Chamber & Pri. Coolers, Elev. and Sections	95	95
CE-104541 (4311)	Walkways & Stairways Test Chamber & Pri. Coolers, Sections and Details	95	95

Reference Drawings - To be assigned later.

ITEM 39 - CONT. AND INSTRUMENTATION PIPING (1st Step)

CE-104509	Control Piping, Plans, Elev. and Details
CE-104510	Control Piping - Sections & Details

Reference Drawings - To be assigned later.

ITEMS 51 AND 52 - EQUIPMENT BUILDING (CE-104700 to CE-104734)

Percentages indicated are as apply to drawings for bidding purposes only and do not necessarily indicate percent of complete drawing.

Architectural (CE-104700 to CE-104734)		Nos. 31 and 32	Nos. 33 and 34
CE-104700	(4701) Plot Plan	3%	15%
CE-104701	(4702) Basement Plan	0	12
CE-104702	(4703) Operating Floor Plan	25	55

Architectural (Continued)		Nos. 31 and 32	Nos. 33 and 34
CE-104703 (4704)	Roof Plan	2	70
CE-104704 (4705)	Control Room & Elec. Mezzanine Plans and Sections	5	65
CE-104705 (4707)	Control Room Details	0	50
CE-104706 (4708)	North Elevation	40	60
CE-104707 (4709)	South Elevation - Wall Sections and Details - Sound Retarding Vert. Lift Door Details	40	55
CE-104708 (4710)	East Elevation	40	55
CE-104709 (4711)	West Elev - Wall Sections and Details	40	60
CE-104710 (4712)	Transverse Section	0	55
CE-104711 (4713)	Longitudinal Section	20	70
CE-104712 (4714)	Typical Wall & Window Details Sheet 1	5	45
CE-104713 (4715)	Typical Wall & Window Details Sheet 2	0	0
CE-104714 (4716)	Typical & Special Door Details	0	5
CE-104715 (4717)	Entrance Details	0	10
CE-104716 (4718)	Toilet & Locker Room Details	0	10
CE-104717 (4719)	Stair & Railing Details - Plans Sheet 1	5	10
CE-104718 (4720)	Stair & Railing Details - Plans Sheet 2	0	10
CE-104719 (4721)	Misc. & Spec. Details - Sht. 1	4	10
CE-104720 (4722)	Misc. & Spec. Details - Sht. 2	4	10
CE-104721 (4723)	Cold & Hot Water Piping Plans	0	5
CE-104722 (4724)	Cold & Hot Water Piping Sections	0	5
CE-104723 (4725)	Sanitary & Storm Sewer Piping - Plans	0	5
CE-104724 (4726)	Sanitary & Storm Sewer Piping Sections	0	5
CE-104725 (4727)	Schedules, Windows, Doors, Hardware Finish	0	5
Structural (CE-104735 to CE-104769)			
Superstructure			
CE-104735 (4731)	Roof Framing Plan - Sections and Details	20	95
CE-104736 (4732)	Roof Trusses, Cols., On Line 4, Bracing and Details	10	50
CE-104737 (4733)	Col. Schedule and Details	0	65
CE-104738 (4734)	Elec. Mezz. & Control Room Floor Framing - Sections and Details	0	75
CE-104739 (4735)	Operating Floor Framing Plans - Sections and Details	5	85

		Nos. 31 and 32	Nos. 33 and 34
Superstructure (Continued)			
CE-104740 (4736)	Crane Girders and Details	10	95
CE-104741 (4737)	Col. Line Elev. - East & West Walls	0	95
CE-104742 (4738)	Col. Line Elev. - North & South Walls	0	80
CE-104743 (4739)	Lower Chord Bracing and Details	0	0
Substructure and Foundations			
CE-104746 (4746)	Building Foundation - Plan, Sections and Details	0	75
CE-104747 (4747)	Building Foundation Details	0	55
CE-104748 (4748)	Basement Floor Plan, Outside Ramp and Steps - Sections and Details	0	50
CE-104749 (4749)	Conc. Encl. for Air Intake & Exh. Pipe	0	70
CE-104750 (4750)	Compressor Foundation - Sheet 1	40	95
CE-104751 (4751)	Compressor Foundation - Sheet 2	10	95
CE-104752 (4752)	Compressor Foundation - Sheet 3	0	0
CE-104753 (4753)	1st Stage Exh. Found. - Sheet 1	50	95
CE-104754 (4754)	1st Stage Exh. Found. - Sheet 2	0	95
CE-104755 (4755)	2nd Stage Exh. Found. - Sheet 1	10	30
CE-104756 (4756)	2nd Stage Exh. Found. - Sheet 2	0	0
CE-104757 (4757)	2nd Stage Exh. Found. - Sheet 3	0	0
CE-104758 (4759)	Misc. Equipment Foundations	0	0
CE-104759 (4770)	Air Heater Foundations	0	10
CE-104760 (4771)	Transformer Foundations - Sht. 1	0	20
CE-104761 (4772)	Transformer Foundations - Sht. 2	0	0
CE-104762 (4773)	Refrig. Equip. Found. - Sheet 1	0	0
CE-104763 (4774)	Refrig. Equip. Found. - Sheet 2	0	0
Electrical (CE-104758 to CE-104799)			
CE-104785 (3701)	Lighting Plan - Basement Floor	0	50
CE-104786 (3702)	Lighting Plan - Operating Floor	0	60
CE-104787 (3703)	Lighting Plan - Mezz. & Control Room	0	20
CE-104788 (3704)	Lighting Details & Fixture Schedule	0	10
CE-104789 (3705)	Outside Lighting - Plans & Details	0	0
CE-104790 (3706)	Grounding Plan	0	0
CE-104791 (3707)	Underground Duct Lines & Manhole Details - Sheet 1	0	15
CE-104792 (3708)	Underground Duct Lines & Manhole Details - Sheet 2	0	20
Mechanical (CE-104770 to CE-104784)			
CE-104770 (2709)	Heating and Vent. System - Operating Floor - Roof and Control Room Plans	10	70
CE-104771 (2710)	Heating and Vent. System - Basement Plan	10	60
CE-104772 (2711)	Heating and Vent. System - Elevs.	10	50
CE-104773 (2713)	Building Service - Steam and Condensate	0	30

Reference Drawings		Nos. 31 and 32	Nos. 33 and 34
CE-104779 (2701)	General Arrangement Plan Operating Floor & Control Room	15	45
CE-104780 (2702)	General Arrangement Plan Basement and Mezzanine	12	45
CE-104781 (2703)	General Arrangement Cross Sections Looking North	12	40
CE-104782 (2704)	General Arrangement Cross Sections Looking North	0	10
CE-104783 (2705)	General Arrangement - Longitudinal Sections	7	30
CE-104784 (2706)	General Arrangement - Longitudinal Sections	5	30

ITEM 53 - PRIMARY ELECTRICAL WORK - EQUIPMENT BUILDING AREA

3715 Main One Line Diagram - Sheet 1
3716 Main One Line Diagram - Sheet 2
3717 Auxiliary One Line Diagram - Sheet 1
3718 Auxiliary One Line Diagram - Sheet 2
3719 Interconnection Wiring Diagram - Sheet 1
3720 Interconnection Wiring Diagram - Sheet 2
3721 Annunciator Schematic Diagram
3722 Wiring Diagram - Sheet 1
3723 Wiring Diagram - Sheet 2
3724 Wiring Diagram - Sheet 3
3725 Wiring Diagram - Sheet 4
3726 Wiring Diagram - Sheet 5
3727 Wiring Diagram - Sheet 6
3728 Conduit Plan - Basement Floor - Sheet 1
3729 Conduit Plan - Basement Floor - Sheet 2
3730 Conduit Plan - Operating Floor - Sheet 1
3731 Conduit Plan - Operating Floor - Sheet 2
3732 Conduit Plan - Gas Fired Air Heaters
3733 Conduit Details - Sheet 1
3734 Conduit Details - Sheet 2
3735 Conduit Details - Sheet 3
3736 13.8 KV Motor Leads - Details - Sheet 1
3737 13.8 KV Motor Leads - Details - Sheet 2
3738 Telephone & Signal System - Basement Floor
3739 Telephone & Signal System - Operating Floor
3740 Telephone & Signal System - Elevations & Details
3741 Riser Diagrams & Schedules - Sheet 1
3742 Riser Diagrams & Schedules - Sheet 2

Reference drawings - To be assigned later.

ITEM 54 - AIR AND GAS PIPING - EQUIPMENT BLDG. AND AIR HEATERS

		Nos. 31 and 32	Nos. 33 and 34
Mechanical			
2716	Equipment Bldg. & Air Heater Area Combustion Air & Gas Piping - Plan	50	70
2717	Equip. Bldg. & Air Heater Area Combustion Air & Gas Piping - Cross Sections	35	50
2718	Equipment Bldg. & Air Heater Area Combustion Air & Gas Piping - Cross Sections	5	10
2719	Equipment Bldg. & Air Heater Area Combustion Air & Gas Piping - Longidudinal Sections	20	40
2720	Equipment Bldg. & Air Heater Area Combustion Air & Gas Piping - Longidudinal Sections	20	60
2721	Equipment Bldg. & Air Heater Area Misc. Elevations and Details	0	0
Structural			
4761	Exhaust Gas Ducts - Details	50	65
4762	Exhaust Gas Ducts - Details	40	50
4763	Combustion Air Piping - Details	40	40
Reference Drawings			
CE-104779 (2701)	General Arrangement Plan Operating Floor and Control Room	15	45
CE-104780 (2702)	General Arrangement Plan Basement and Mezzanine	12	45
CE-104781 (2703)	General Arrangement Cross Sections Looking North	12	40
CE-104782 (2704)	General Arrangement Cross Sections Looking North	0	10
CE-104783 (2705)	General Arrangement - Longitudinal Sections	7	30
CE-104784 (2706)	General Arrangement - Longitudinal Sections	5	30

40C. VACUUM DEAERATION SYSTEM

Mechanical			
2457	Flow Diagram - Water Treatment and Deaeration System	0	60
2450	General Arrangement - Deaerating Tanks	0	60
2451	Deaerating Tanks - Details and Internals	0	40
2452	Deaerating System - C.W. Piping - Plans and Details	0	30

		Nos. 31 and 32	Nos. 33 and 34
Structural			
	Deaerating Tanks - Structural Steel Supports - Plans & Elev.	0	10
	Deaerating Tanks - Structural Steel Supports - Sections and Details	0	0

Reference Drawings - To be assigned later.

40D. - PIPING - WATER TREATMENT SYSTEM

Mechanical

2457	Flow Diagram - Water Treatment and Deaeration System	0	60
2459	Water Softening System - Plans and Sections	0	70
2458	Water Treatment System - Minor Area Piping	0	25

Reference Drawings - To be assigned later.

ITEM 55 - GEN. SERV. PIPING - EQUIPMENT BUILDING AREA

Mechanical

2731	Circulating Water Piping Plan
2732	Circulating Water Piping Elevations
2733	Circulating Water Piping Sections
2734	Circulating Water Piping Details
2735	Utility Compressed Air Piping - Plan
2736	Utility Compressed Air Piping - Elevations and Sections
2737	Intercooler Drain Piping
2738	Lubricating Oil Piping - Plan
2739	Lubricating Oil Piping - Elevations and Sections

Reference Drawings - To be assigned later.

ITEM 56 - REFRIGERATION EQUIPMENT AND PIPING

Mechanical

2741	General Arrgt. Plan of Refrigeration and Drying System
2742	Gen. Arrgt. Elevations of Refrigeration and Drying System
2743	Gen. Arrgt. Sections of Refrigeration and Drying System

Reference Drawings - To be assigned later.

ITEM 68A. - CONTROL AND INSTRUMENTATION PIPING - EQUIPMENT BLDG. AREA

Mechanical

2751	Instrument Lists
2752	Instrument Lists
2753	Instrument Piping - Plan
2754	Instrument Piping - Elevations and Details
2755	Control Air Piping - Plan
2756	Control Air Piping - Elev. and Details
2757	Hydraulic Valve - Oil Piping - Plan
2758	Hydraulic Valve - Oil Piping - Details

ITEM 75 - SUBSTATION "B" & "G" - STRUCTURE & EQUIPMENT

Electrical

3606	Substation "G" Plan, Elevations and Sections (Existing and New Bays)
3602	Substation "B" Plan, Elevations and Sections (Bays 1, 2, 6 and 7)

Structural

4601	Substation "G" Reactor Foundations and Manholes

Reference drawing - To be assigned later.

ITEM 73 - 34.5 KV CABLE INSTALLATION

These drawings have been completed and were forwarded to NACA on April 6th for final approval and comments.

ITEM 76 - PRIMARY ELECTRICAL WORK - SUBSTATION AREA

Electrical

3601	Substation "A" Wiring Diagrams, Control, Relaying and Alarms
3604	Substation "B" Wiring Diagrams, Control, Relaying and Alarms
3605	Substation "G" Arrangement Plan Including Lighting and Grounding One Line Diagram
3608	Substation "G" Wiring Diagrams Control, Relaying and Alarms
3609	Substation "G" Conduit Plan
3610	Underground Ductlines (34.5 KV) 2nd Step Construction
3612	Substation "B" Arrangement Plan Including Grounding and One Line Diagram

Reference Drawings - To be assigned later.

Progress

The percentages listed below are estimated to be the completion status of the Project as of April 1st, 1950.

	Nos. 31 and 32	Nos. 33 and 34
1. Operations Building	100	100
Amendment #1	100	100
Amendment #2	100	100
2. Altitude Test Chambers	99	99
3. Shop and Access Building	98	99
4. Test Air Piping	94	96
Amendment #3	100	100
5. Cooling Tower & C. W. System	95	95
6. Fuel Storage and Distribution System	93	95
7. Electrical Substations	30	45
8. Equipment Building and Equipment	30	40

DRMcConathy/KBH/RDK/LHR/id

DRMc Conathy

RESTRICTED

Clinton 1-6620
xxxxxx
Teletype-CV520

May 3, 1950

Progress reports + letter of 4/17/50 + 5/3/50 were routed to:
William Kotter Nyman
Noon Berg Smith

Burns and Roe, Inc.
233 Broadway,
New York 7, New York

Attention: Mr. D. R. McConathy.

Subject: Contract NAw-3652 - Architect-Engineer Services for Propulsion Sciences Laboratory, Phase I, Part II, Project No. 794 - Progress Reports No. 33 and 34.

Gentlemen:

The following comments on Progress Reports No. 33 and 34 will answer the underlined items which were not taken care of in our letter of April 17, 1950.

Item 1 - Manufacturers' nameplate data etc. was supplied to Burns and Roe April 24, 1950. Burns and Roe sketch of cable termination on the low voltage 13.8KV side of the main transformer was transmitted to General Electric April 24, 1950.

Item 2 - Handled in Item 35 in our letter of April 17, 1950 to Burns and Roe.

Item 3 - All exhauster drawings have been sent to Burns and Roe except for lube oil connections which will be sent shortly. List of auxiliaries and their horsepower requirements has been received from Roots-Connersville Blower Corporation in their letter of April 28, 1950. Burns and Roe sketch of exhaust discharge piece has been incorporated in Roots-Connersville's contract. Outline drawings for motor coolers were sent to Burns and Roe April 17, 1950.

Item 4 - The Elliott Company has been requested to submit a list of horsepower requirements of all auxiliaries.

Item 11- All wiring and regulator drawings have been sent to Burns and Roe. Oil pump and tank drawings are expected shortly from Askania Regulator Company.

Item 18- The Hatfield Electric Company has been requested to furnish control cubicle and wiring drawings.

RESTRICTED

Item 23B - All drawings requested were sent to Burns and Roe April 12, 1950.

Item 24 - All information requested was sent to Burns and Roe April 10, 1950 and April 21, 1950.

Item 25 - The Robert Carter Company will not submit further drawings since they plan to adhere to NACA contract drawings.

Item 26 - The Chapman Valve Company will supply starters and motors for valves. The Primary Electrical contractor will furnish and install pushbuttons and wiring.

Item 27 - Information requested is expected shortly.

Item 54 - Mr. Burke of Askania Regulator Company is to discuss the bleed piping and control system of the exhausters and compressors with NACA May 8, 1950. This design should be settled by May 15, 1950.

Items 58, 59, and 67 - Same as above.

Yours very truly,

Representative of the Contracting Officer.

In triplicate.
cc: Resident Engineer.

WES:pl
EDW
CGF

cc: C&CA files
PSL Files
C. A. Herrmann
W. L. Wilson
PSL Advance ✓

April 17, 1950 Winton 1-6620

Teletype - CV520

Burns and Roe, Inc.
233 Broadway,
New York 7, New York

Attention: Mr. D. A. McConathy.

Subject: Contract NAw-5652 - Architect-Engineer Services for Propulsion Sciences Laboratory, Phase I, Part II, Project No. 794 - Progress Reports No. 33 and 34.

Gentlemen:

The following comments on your Progress Reports Nos. 33 and 34 are on items not out on contract. Information needed on contracted items will be supplied shortly. Almost all the information requested in Progress Reports Nos. 31 and 32 has already been supplied. The following information is that requested in your latest progress report and that not answered for the previous reports.

Item 35 - Walkways and Stairways.

Primary cooler and test chamber stairways and catwalk drawings were checked by the Foster Wheeler Company. No interference was found and the drawings were returned with no comments. Foster Wheeler stated the instrument and other smaller piping could be easily routed around the stairways and platforms. These drawings, along with the sketches of the transformer platform and gasoline piping in this area, were approved by NACA and returned to Burns and Roe on April 4, 1950.

Item 48 - Combustion-Air Expansion Joints.

Specifications have been checked by NACA. These will be issued to bidders when the drawings are submitted by Burns and Roe.

Item 50 - Fire Protection.

Specifications and layout of the Low-Pressure Pump House have been set up with Mr. L. Danner, Cleveland representative of the Cardox Corporation. This information will be forwarded in the near future to Burns and Roe.

Work is being done on specifications and layout of a CO_2 system combining the Shop and Access Building, the High-Pressure Fuel Pump House, and the Equipment Building through one CO_2 tank. This CO_2 tank will be located between the 13-foot diameter exhaust-gas duct and the combustion-air pipe trench.

Items 51 and 52 - Equipment Building.

Information has been sent to Burns and Roe to permit work on all electrical equipment. Additional information on the 2300-volt transformer will be forwarded as soon as it is received by NACA. Please request specific information as to further information needed.

The throw-away combustion-air intake stack filters should be changed to a cleanable-wire type.

Item 56A - Expansion Turbine.

Drawings on this machine are due from the Elliott Company on April 30, 1950.

Item 65 - Lube Oil System.

Information as to oil capacities of both systems and the heat rejection of the exhauster has been sent to Burns and Roe. The Elliott Company has given NACA verbal specifications on the compressor system oil heat rejection. Official verification will be given shortly. This verbal information was given to Burns and Roe in a note delivered by Mr. Berg during his trip to New York on April 12, 1950.

Item 66 - Building Cranes.

The weight of large motor rotors should be proportional to the horsepower of the motors, possibly decreasing slightly as the power increases. The present 16,000-horsepower compressor motor rotor weighs 24 tons. A 23,000/16,000 factor, or the ratio of the future to present motor horsepower, times the 24 tons will give a predicted weight of 34 tons for the future rotor weight. Since this is only a 36-percent overload to be used only once or twice, we feel the 25-ton capacity is satisfactory for the compressor crane.

Item 67 - Exhauster and Compressor Control Panels.

The Elliott Company and the Roots-Connersville Blower Corporation have been asked to submit similar pressure and temperature gages.

Item 72 - Switchgear Control Equipment, Transformers, and Exhausters.

Outline drawings of the equipment for the electrical bay and outdoor transformer substation have been sent to Burns and Roe. Additional detailed information will be forwarded as received by NACA.

Yours very truly,

Representative of the Contracting Officer.

In triplicate.

cc: Resident Engineer.

WES:rp
EDW

cc: C&CA Files
PSL Files
C. A. Herrmann
W. L. Wilson
PSL Advance

PSL files

A99298

cc: C&CA files
PSL files
C. A. Herrmann
C. G. Fox
PSL Advance

WInton 1-6620
XXXXXXX
Teletype-CV520

May 5, 1950

Burns and Roe, Inc.,
233 Broadway,
New York 7, New York.

Attention: Mr. D. E. McConathy.

Subject: Contract NAw-5652 - Architect-Engineer Services for Propulsion Sciences Laboratory, Phase I, Part II, Project No. 794 - Progress Reports No. 33 and 34.

Gentlemen:

The information requested in your letter of May 2, 1950 is as follows:

Item 50 - The Low Pressure Pump House CO_2 specifications are being mailed to Burns and Roe today. Shop and Access and the Equipment Building CO_2 system specifications are being reviewed and will be sent to you by May 12, 1950.

Item 51 and 52. The Westinghouse Electric Corporation will complete the outline drawings of the 2400-volt transformer and the regulators in the next few days. All other drawings will be completed in June.

Item 67.- The controls of the exhausters and compressors will be determined by May 19, 1950. This will fix the control devices so that you may then start the design of the machine control panels.

Item 72 - The Westinghouse Electric Corporation will complete all their drawings during June.

Yours very truly,

WES:pl
OJH
EDW

Representative of the Contracting Officer.

In triplicate.
cc: Resident Engineer

PROGRESS REPORTS NO. 35 AND 36

Subject: National Advisory Committee for Aeronautics
Propulsion Science Research Laboratory
Project No. 794 (NAw-5652) - B&R W.O. #1218

May 5, 1950

cc:NACA-4
EJT

RCR
RFC
WAB
KAR
WLG-2
RRB-2
PJM
JBM
AAV-4
KBH-3
WGC-3
RDK-3
LHR-4
GHT
DRM
C.FILES

SECTION I

The following Progress Report will cover the month of April, 1950 and is submitted in the same general form as previous reports.

Item 1 (25,000 KVA Power Transformers)

a) Awaiting manufacturers' nameplate data and wiring diagram drawings. Please expedite.

b) Foundations for transformer cable vault are included as part of the Equipment Building Contract.

c) Awaiting drawings from G.E. showing arrangement of cable termination on the low voltage 13.8 KV connection.

Item 3 (Exhauster System With Motors)

a) Final check drawings have now been received from Roots-Connersville for the right hand and left hand second stage exhausters.

Item 4 (Compressor System With Motors)

a) Please request Elliott to tabulate auxiliaries, with hp requirements for compressors. Please expedite same.

Item 11 (Pressure Control Stations)

a) We still require wiring diagrams, oil pump drawings, oil tank drawings. See our letter of March 30th requesting this information.

b) Awaiting comments from Pratt on access walkways to operating cylinders on exhaust gas control valves.

Item 16 (Inter and After Coolers - Spec. Items 1,3 and 7)

a) All drawings from Griscom-Russell have been received except the arrangement of condensate pumps for Items 3 and 7. Griscom-Russell submitted to Burns and Roe preliminary sketches for the pumps and piping and Burns and Roe are making a study of proper arrangement.

Item 18 (Shop and Access Building)

a) Proposed Change Order No. 22 showing electrical revisions was issued May 3, 1950.

b) Burns and Roe awaiting specifications being prepared by NACA on the Cardox System.

c) Require shop drawings for control cubicle outline and wiring drawings. These drawings actually refer to the hatch cover control for the Altitude Test Chamber. Please expedite.

d) Refer to Bid Schedule Report (C.G. Fox) dated April 18, 1950. Under drawings received from G.E. covering switchgear layout of which was changed in Conference at NACA on 4-12-50. Please expedite.

Item 23B. (Transformer and Motor Control Center - K.P. F. P.H.)

a) Approval drawings returned as noted. Awaiting final revised shop drawings.

Item 23C. (Switchgear - Water Treatment Area)

This item has been eliminated. The switchgear originally anticipated here has been made part of Item 40B. (Mixed Flow Booster Pumps, Motors and Switchgear)

Item 24 (Gas Fired Air Heaters)

a) Burns and Roe have been working closely with Petro Chem to establish construction details at the bottom of the heaters to provide clearances for air inlet piping. Petro Chem making a layout drawing showing location of columns to clear the piping as suggested by Burns and Roe. They will submit this layout to Burns and Roe for review before submitting final drawings to NACA for approval.

b) Information has been received from Petro Chem on control panel boards, electrical connections and natural gas piping.

Item 25 (Exhaust Gas Duct System)

a) Carter general arrangement drawings have been received and returned. No other drawings submitted.

b) A bypass from the discharge of the expander turbine to the 13' diameter exhaust duct has been designed. The exhaust gas duct is of carbon steel. There is some question as to whether or not the minus 70° air will be tempered with hot gases in the exhaust gas ducts as the entire duct system had been designed for a minimum temperature of minus 30°. NACA please inform.

c) Change Order #24 covering the addition required to Carter's contract for the accommodation of the turbine bypass line has been issued on May 4th.

Item 26 (Two 48" Motor Operated Gate Valves)

a) Controls to be furnished as part of motor operated valves. Obtain shop drawings for outline and wiring diagrams.

Item 27 (Variable Frequency Starting and Exciting Equipment)

a) Still awaiting shop drawings for slip regulator including sump pit requirements and heat exchanger outline. Please expedite.

b) As part of the slip regulator, request Westinghouse to furnish list of auxiliaries and hp requirements.

Item 29 (Combustion Air Piping System)

a) Drawings CE-104503 and CE-104506 are being revised in accordance with marked prints returned by NACA with their letter of April 25, 1950. Final sepia prints of these drawings will be sent to NACA on May 5th, 1950.

b) Burns and Roe will further investigate the possibility of using silican killed carbon steel in place of nickel steel for lines under temperatures of minus 70°F.

Item 30 (Circulating Water Piping System)

a) Bid has been awarded to Carter Company. Awaiting shop drawings.

b) We contemplate issuance of a Change Order covering minor revisions such as connection to atmospheric exhaust stack, removal of tee on end of natural gas line and relocation of 48" return header adjacent to Pump House to clear vacuum deaerator.

Item 31 (Fuel Piping System)

a) Specifications received from NACA on May 4th - awaiting bids from vendors.

Item 32 (P.H., Exhaust Gas Stack, Pipe Supports and Tank Foundations)

a) Proposed Change Order No. 21 covering revisions to trench, exhaust gas duct foundations was issued April 28, 1950.

b) Proposed Change Order No. 23 covering revisions to C.W. Pump House to include the salt storage basin will be issued shortly. This Change Order has been delayed due to investigations of foundation problems for supporting vacuum deaerators. Proposed Change Order No. 23 will also include relocation of slot openings in mezzanine floor of Pump House for switchgear relocation.

Item 32A. (H.P. Fuel Pump House)

a) Specifications and drawings for High Pressure Pump House have been issued to bidders by NACA. Certain minor corrections to drawings were discussed in Conference No. 43. These changes are being incorporated on the tracings and will be available to NACA for discussion with the low bidder to determine any affect on price.

Item 33 (Primary Electrical Work - 1st Step Construction)

a) Final specifications and sepia tracings were issued to NACA on April 14th. To our knowledge this has not been released to contractors.

Item 35 (Walkways and Stairways - Altitude Chamber and Coolers)

a) Comments have been received from NACA on drawings showing platforms to Altitude Chamber and primary coolers. Further comments are awaited on drawings showing platforms to exhaust gas control valves, exhaust gas ducts and secondary coolers.

b) This contract will also include certain pipe supports for supporting elevated piping to and from the gas fired air heaters.

Item 37 (Thrust Platform and Thrust Transmitting Device)

a) Contract for Thrust Platform and Thrust Transmitting Device has been awarded to Treadwell. Awaiting shop drawings.

Item 38 (Panel Boards - Shop and Access Building)
Item 39 (Control and Instrumentation Piping - 1st Step)

Insufficient information is available to permit design of this work.

Item 40A. (Zeolite Softening and Chlorination System)

a) NACA is now making specifications ready for issuance to bidders and they will advise us when they will require the drawings. No comments have been received on drawings submitted.

b) The Chlorination System being deleted from Zeolite Softening specification. Will be issued at a future time.

c) Drawings for this contract will be ready for issuance to contractors about May 17, 1950.

Item 40B. (Mixed Flow Booster Pumps)

a) Revisions to specifications forwarded May 4th including section covering related switchgear.

Item 40C. (Vacuum Deaerator System)

a) Approval specification and prints of the required contract drawings in their present status will be submitted about May 10th for comments. Approval prints and the complete drawings will be available for the week of May 22nd. We would appreciate any comments that you have on these earlier prints in order that same may be incorporated as quickly as possible.

b) Structural supporting steel for the vacuum deaerators has been included as part of the contract for the vacuum deaerators.

c) It is anticipated that the foundations for the deaerators and the underground concrete duct from the Cooling Tower basin will be added to Hansen's contract by Change Order later.

Item 40D. (Piping System - Water Treatment Equipment - Small Piping - Water Treating)

a) Piping drawings making up this contract will be submitted simultaneously with drawings included in Item 40C.

Item 42 (Fuel Metering Equipment)

a) It is our understanding that NACA is preparing specifications for purchase of this equipment.

Item 43 (Fuel Pressure Control System)

a) Bids are being analyzed by NACA for this system. Telephone conversations indicate that some changes will have to be made in the low bidder's proposal in order to comply with required operating conditions.

Item 44A. (Gasoline Drainage Pumps)

a) Awaiting drawings on P.O. C-35251 - Strong Carlisle and Hammond for Gasoline Drainage Pumps.

Item 45 (2-48" Combustion Air Valves - Butterfly)

a) NACA has requested Pratt Company to substitute manual operation for valves instead of motor operated.

Item 45A. (2-48" Butterfly Valves - Pressure Control)

a) This Item will be included with Item 63.

Item 48 (Expansion Joints - Combustion Air System)

a) Drawings for expansion joints are being revised in accordance with marked prints returned by NACA with their letter of April 25. Sepia tracings will be issued May 5th.

b) Final specifications have already been prepared by NACA.

Item 50 (Fire Protection - 1st Step)

a) Awaiting final specification now being prepared by NACA. Some provisions of this specification will affect fuel distribution system controls.

Item 63 (Combustion Air System Valves)

a) Burns and Roe letter to NACA dated April 19th covers tentative specifications for these valves. Final specification will be issued to NACA about May 19th.

Item 65 (Lube Oil System)

a) All information from vendors necessary for designing this system has now been received.

b) Burns and Roe are now obtaining information from vendors on pumps, filters, heat exchangers, etc., and studies are being made of arrangement of this equipment for the basement of the Equipment Building.

c) Specifications for all of this equipment will be ready to issue to NACA about May 26th.

Item 66 (Building Cranes)

a) Specifications issued for bid by NACA on April 21, 1950. A proposed addendum will be sent to NACA to more closely indicate under which contract the crane stops will be specified.

Item 67 (Exh. and Compressor Control Panels)

a) These panels cannot be developed until adequate information is available on exhauster and compressor control systems, under Items 58 and 59.

Item 70 (Misc. Elec. Equipment - Equipment Building Area)

a) Specifications covering lighting substations, power unit substations and motor control center will be prepared as soon as motor hp requirements have been complete.

Item 72 (Swgr. Control Equip. Trans. & Aux. - Comp. & Exh. Motors)

a) No outline drawings have been received from Westinghouse for the starting and running 13.8 KV switchgear and 2300-V auxiliary switchgear. Please expedite.

Item 73 (34.5 KV Cable Installation)

a) Sepia tracings were sent to NACA May 3rd incorporating all comments and suggestions.

33937

Item 75 (Substation "B" and "G" Struc. and Equipment)

a) Burns and Roe are checking mechanical forces developed on new copper taps and bus extensions for substations "B" and "G". This information will be available the week of May 8th.

b) No comments have been received from NACA on drawings for substations "B" and "G" which were sent to NACA for approval.

General

Attention: Mr. C. G. Fox - In reference to Bid Schedule Status Report it would be desirable in the Remarks Column wherever possible and available to include date when drawings are sent to contractors Approved or Approved As Noted after receipt of same from Burns and Roe.

SECTION II - See Section II for progress of Contract Drawings.

Progress

The percentages listed below are estimated to be the completion status of the Project as of May 1st, 1950.

		Nos. 33 and 34	Nos. 35 and 36
1.	Operations Building	100%	100%
	Amendment #1	100	100
	Amendment #2	100	100
2.	Altitude Test Chambers	99	99
3.	Shop and Access Building	99	99
4.	Test Air Piping	96	97
	Amendment #3	100	100
5.	Cooling Tower & Circulating Water System	95	95
6.	Fuel Storage and Distribution System	95	95
7.	Electrical Substations	45	55
8.	Equipment Building and Equipment	40	55

DRMcConathy/KBH/LHR/RDK/GHT/WGC/id

DRMcConathy

May 15, 1950.

Memo to Ehlers and Snider.

Referring to Burns and Roe, D.R. McConathy letter of May 5th, our serial No. 33917, he asked for:

1. Outline drawing of high pressure oil pump.
2. Outline drawing of low pressure oil pump.
3. Outline drawing of high pressure pump oil tank.
4. Pump Control Panels and wiring diagrams.
5. Accumulators.

I wired Askania May 10 and May 15 [redacted] R.V. Suhrke called me stating that on No. 1 De Laval Imo Products Division at Trenton, New Jersey will furnish drawings direct to Burns and Roe and NACA but Askania purchase order is just being mailed to De Laval on account of the delay that Askania had in developing the proper or increased oil consumption on relays. We will be advised when these drawings will be available.

On No. 2 De Laval Imo Division will also supply drawings to Burns and Roe and NACA and we should know when these drawings will be available when Askania secures this information today or tomorrow.

No. 3, these drawings are being mailed from Chicago today.

No. 4, the wiring diagrams are being worked on at Askania who expect to finish by May 19 but this is not definite and it might be the week of May 22nd to 26th, but they will advise. The panels will be one week later.

No. 5, [redacted] drawings are being mailed from Chicago today.

In addition, drawings on pressure switches for both HP and LP oil pumps and relief valves for LP oil pumps are being mailed from Chicago today.

C.G. Fox

PROGRESS REPORTS NO. 35 AND 36

Subject: National Advisory Committee for Aeronautics
Propulsion Science Research Laboratory
Project No. 794 (NAw-5652) - B&R W.O. #1218

May 5, 1950

cc:NACA-4
EJT

RCR
RFC
WAB
KAR
WLG-2
RRB-2
PJM
JBM
AAV-4
KBH-3
WGC-3
RDK-3
LHR-4
GHT
DRM
C.FILES

SECTION I

The following Progress Report will cover the month of April, 1950 and is submitted in the same general form as previous reports.

Item 1 (25,000 KVA Power Transformers)

a) Awaiting manufacturers' nameplate data and wiring diagram drawings. Please expedite.

b) Foundations for transformer cable vault are included as part of the Equipment Building Contract.

c) Awaiting drawings from G.E. showing arrangement of cable termination on the low voltage 13.8 KV connection.

Item 3 (Exhauster System With Motors)

a) Final check drawings have now been received from Roots-Connersville for the right hand and left hand second stage exhausters.

Item 4 (Compressor System With Motors)

a) Please request Elliott to tabulate auxiliaries, with hp requirements for compressors. Please expedite same.

Item 11 (Pressure Control Stations)

a) We still require wiring diagrams, oil pump drawings, oil tank drawings. See our letter of March 30th requesting this information.

b) Awaiting comments from Pratt on access walkways to operating cylinders on exhaust gas control valves.

Item 16 (Inter and After Coolers - Spec. Items 1,3 and 7)

a) All drawings from Griscom-Russell have been received except the arrangement of condensate pumps for Items 3 and 7. Griscom-Russell submitted to Burns and Roe preliminary sketches for the pumps and piping and Burns and Roe are making a study of proper arrangement.

Item 18 (Shop and Access Building)

a) Proposed Change Order No. 22 showing electrical revisions was issued May 3, 1950.

b) Burns and Roe awaiting specifications being prepared by NACA on the Cardox System.

c) Require shop drawings for control cubicle outline and wiring drawings. These drawings actually refer to the hatch cover control for the Altitude Test Chamber. Please expedite.

d) Refer to Bid Schedule Report (C.G. Fox) dated April 18, 1950. Under drawings received from G.E. covering switchgear layout of which was changed in Conference at NACA on 4-12-50. Please expedite.

Item 23B. (Transformer and Motor Control Center - H.P. F. P.H.)

a) Approval drawings returned as noted. Awaiting final revised shop drawings.

Item 23C. (Switchgear - Water Treatment Area)

This item has been eliminated. The switchgear originally anticipated here has been made part of Item 40B. (Mixed Flow Booster Pumps, Motors and Switchgear)

Item 24 (Gas Fired Air Heaters)

a) Burns and Roe have been working closely with Petro Chem to establish construction details at the bottom of the heaters to provide clearances for air inlet piping. Petro Chem making a layout drawing showing location of columns to clear the piping as suggested by Burns and Roe. They will submit this layout to Burns and Roe for review before submitting final drawings to NACA for approval.

b) Information has been received from Petro Chem on control panel boards, electrical connections and natural gas piping.

Item 25 (Exhaust Gas Duct System)

a) Carter general arrangement drawings have been received and returned. No other drawings submitted.

b) A bypass from the discharge of the expander turbine to the 13' diameter exhaust duct has been designed. The exhaust gas duct is of carbon steel. There is some question as to whether or not the minus 70° air will be tempered with hot gases in the exhaust gas ducts as the entire duct system had been designed for a minimum temperature of minus 30° NACA please inform.

c) Change Order #24 covering the addition required to Carter's contract for the accommodation of the turbine bypass line has been issued on May 4th.

Item 26 (Two 48" Motor Operated Gate Valves)

a) Controls to be furnished as part of motor operated valves. Obtain shop drawings for outline and wiring diagrams.

Item 27 (Variable Frequency Starting and Exciting Equipment)

a) Still awaiting shop drawings for slip regulator including sump pit requirements and heat exchanger outline. Please expedite.

b) As part of the slip regulator, request Westinghouse to furnish list of auxiliaries and hp requirements.

Item 29 (Combustion Air Piping System)

a) Drawings CE-104503 and CE-104506 are being revised in accordance with marked prints returned by NACA with their letter of April 25, 1950. Final sepia prints of these drawings will be sent to NACA on May 5th, 1950.

b) Burns and Roe will further investigate the possibility of using silicon killed carbon steel in place of nickel steel for lines under temperatures of minus 70°F.

Item 30 (Circulating Water Piping System)

a) Bid has been awarded to Carter Company. Awaiting shop drawings.

b) We contemplate issuance of a Change Order covering minor revisions such as connection to atmospheric exhaust stack, removal of tee on end of natural gas line and relocation of 48" return header adjacent to Pump House to clear vacuum deaerator.

Item 31 (Fuel Piping System)

a) Specifications received from NACA on May 4th - awaiting bids from vendors.

Item 32 (P.H., Exhaust Gas Stack, Pipe Supports and Tank Foundations)

a) Proposed Change Order No. 21 covering revisions to trench, exhaust gas duct foundations was issued April 28, 1950.

b) Proposed Change Order No. 23 covering revisions to C.W. Pump House to include the salt storage basin will be issued shortly. This Change Order has been delayed due to investigations of foundation problems for supporting vacuum deaerators. Proposed Change Order No. 23 will also include relocation of slot openings in mezzanine floor of Pump House for switchgear relocation.

Item 32A. (H.P. Fuel Pump House)

a) Specifications and drawings for High Pressure Pump House have been issued to bidders by NACA. Certain minor corrections to drawings were discussed in Conference No. 43. These changes are being incorporated on the tracings and will be available to NACA for discussion with the low bidder to determine any affect on price.

Item 33 (Primary Electrical Work - 1st Step Construction)

a) Final specifications and sepia tracings were issued to NACA on April 14th. To our knowledge this has not been released to contractors.

Item 35 (Walkways and Stairways - Altitude Chamber and Coolers)

a) Comments have been received from NACA on drawings showing platforms to Altitude Chamber and primary coolers. Further comments are awaited on drawings showing platforms to exhaust gas control valves, exhaust gas ducts and secondary coolers.

Zwirko to check Pratt 5-17-50 on valve platforms

b) This contract will also include certain pipe supports for supporting elevated piping to and from the gas fired air heaters.

Item 37 (Thrust Platform and Thrust Transmitting Device)

a) Contract for Thrust Platform and Thrust Transmitting Device has been awarded to Treadwell. Awaiting shop drawings.

Item 38 (Panel Boards - Shop and Access Building)
Item 39 (Control and Instrumentation Piping - 1st Step)

Insufficient information is available to permit design of this work.

Item 40A. (Zeolite Softening and Chlorination System)

a) NACA is now making specifications ready for issuance to bidders and they will advise us when they will require the drawings. No comments have been received on drawings submitted.

b) The Chlorination System being deleted from Zeolite Softening specification. Will be issued at a future time.

c) Drawings for this contract will be ready for issuance to contractors about May 17, 1950.

Item 40B. (Mixed Flow Booster Pumps)

a) Revisions to specifications forwarded May 4th including section covering related switchgear.

Item 40C. (Vacuum Deaerator System)

a) Approval specification and prints of the required contract drawings in their present status will be submitted about May 10th for comments. Approval prints and the complete drawings will be available for the week of May 22nd. We would appreciate any comments that you have on these earlier prints in order that same may be incorporated as quickly as possible.

b) Structural supporting steel for the vacuum deaerators has been included as part of the contract for the vacuum deaerators.

c) It is anticipated that the foundations for the deaerators and the underground concrete duct from the Cooling Tower basin will be added to Hansen's contract by Change Order later.

Item 40D. (Piping System - Water Treatment Equipment - Small Piping - Water Treating)

a) Piping drawings making up this contract will be submitted simultaneously with drawings included in Item 40C.

Item 42 (Fuel Metering Equipment)

a) It is our understanding that NACA is preparing specifications for purchase of this equipment.

Item 43 (Fuel Pressure Control System)

a) Bids are being analyzed by NACA for this system. Telephone conversations indicate that some changes will have to be made in the low bidder's proposal in order to comply with required operating conditions.

Item 44A. (Gasoline Drainage Pumps)

a) Awaiting drawings on P.O. C-35251 - Strong Carlisle and Hammond for Gasoline Drainage Pumps.

Item 45 (2-48" Combustion Air Valves - Butterfly)

a) NACA has requested Pratt Company to substitute manual operation for valves instead of motor operated.

Item 45A. (2-48" Butterfly Valves - Pressure Control)

a) This Item will be included with Item 63.

Item 48 (Expansion Joints - Combustion Air System)

a) Drawings for expansion joints are being revised in accordance with marked prints returned by NACA with their letter of April 25. Sepia tracings will be issued May 5th.

b) Final specifications have already been prepared by NACA.

Item 50 (Fire Protection - 1st Step)

a) Awaiting final specification now being prepared by NACA. Some provisions of this specification will affect fuel distribution system controls.

Items 51 and 52 (Equipment Bldg. SubStructure and Foundations)
(Equipment Building SuperStructure & Bldg. Serv.)

a) Draft of specifications were sent to NACA on April 28th after having been discussed in Conference No. 43. NACA will review these specifications and prepare them for issuance to bidders. Letter is being sent to NACA on May 4th indicating certain minor corrections to be incorporated in the final specifications and also recommending items for which unit prices are to be requested.

b) Sepias of drawings ready for issuance to bidders will be sent to NACA on May 4th. For percentage of final completion of drawings see Section II of this progress report.

c) Before drawings can be fully complete, all the information requested under the various items for this Progress Report will be required in so far as the equipment building foundations, equipment foundations and other items indicated as part of the Equipment Building are concerned. It is anticipated that a portion of these revisions can be made before the final award of the contract.

Item 53 (Primary Electrical Work - Equipment Building Area)

a) One line diagrams for Equipment Building and auxiliaries have been sent to NACA for comments. Revisions will be made as hp requirements for additional auxiliary equipment are received from various bidders. Additional study drawings are in preparation for termination at switchgear and motors.

Item 54 (Air and Gas Piping - Equipment Building and Air Heaters)

a) Complete drawings and specifications for air and gas piping issued to NACA for approval on April 28th. These drawings are as complete as it was possible to make with the information we have on various parts of the equipment.

b) Corrections are being made to some of these drawings to cover the details of expansion joints and miscellaneous piping supports. We expect to have all of this work completed by May 15th. Awaiting NACA's comments on the drawings submitted on April 28th.

Item 55 (General Service Piping - Equipment Building Area)

a) Design of continuation of C.W. System trench, etc. outside of building is being developed. Main piping to be awarded under this contract within the building is being studied and tentative locations for headers agreed upon. Lube Oil Piping is being considered.

Item 56 (Air Drying and Refrigeration)

a) NACA issued specifications to vendors on April 12, 1950. Specifications limited system to a dehydration system coupled with cooling for supplying the expander. Amendments #1 and 2 issued permitting more diversified bidding and extending opening date of bids to May 19, 1950.

Item 56A. (Expander Turbine)

a) Preliminary drawing of expander turbine received from Elliott April 25th. Drawing returned with letter of explanation by Burns and Roe on April 25th.

b) Burns and Roe will give further consideration of foundation requirements.

Items 58 and 59 (Compressor System - Controls)
Exhaust System - Controls)

Burns and Roe are awaiting proposal information for compressor and exhauster system controls. This information will directly tie in with the bleeder piping as stated previously. Bleeder Piping - sizes, location, etc. must be determined immediately.

Item 60 (Check Valves - Exh. and Compressor Systems)

a) Information at NACA - no record of invitation to bid being issued to contractors.

Item 61 (Butterfly Valves - Exh. Gas System)

a) Information at NACA - no record of invitation to bid being issued to contractors.

Item 62 (Rubber Expansion Joints at Machines)

a) Specifications issued to NACA on April 6th - no record of invitation to bid being issued to contractors.

Item 62A. (Expansion Joints for Combustion Air System)

a) Specifications issued to NACA on April 28th. Final drawings to accompany this specification will be issued to NACA about May 15th.

Item 63 (Combustion Air System Valves)

a) Burns and Roe letter to NACA dated April 19th covers tentative specifications for these valves. Final specification will be issued to NACA about May 19th.

Item 65 (Lube Oil System)

a) All information from vendors necessary for designing this system has now been received.

b) Burns and Roe are now obtaining information from vendors on pumps, filters, heat exchangers, etc., and studies are being made of arrangement of this equipment for the basement of the Equipment Building.

c) Specifications for all of this equipment will be ready to issue to NACA about May 26th.

Item 66 (Building Cranes)

a) Specifications issued for bid by NACA on April 21, 1950. A proposed addendum will be sent to NACA to more closely indicate under which contract the crane stops will be specified.

Item 67 (Exh. and Compressor Control Panels)

a) These panels cannot be developed until adequate information is available on exhauster and compressor control systems, under Items 58 and 59.

Item 70 (Misc. Elec. Equipment - Equipment Building Area)

a) Specifications covering lighting substations, power unit substations and motor control center will be prepared as soon as motor hp requirements have been complete.

Item 72 (Swgr. Control Equip. Trans. & Aux. - Comp. & Exh. Motors)

a) No outline drawings have been received from Westinghouse for the starting and running 13.8 KV switchgear and 2300-V auxiliary switchgear. Please expedite.

Item 73 (34.5 KV Cable Installation)

a) Sepia tracings were sent to NACA May 3rd incorporating all comments and suggestions.

Item 75 (Substation "B" and "G" Struc. and Equipment)

a) Burns and Roe are checking mechanical forces developed on new copper taps and bus extensions for substations "B" and "G". This information will be available the week of May 8th.

b) No comments have been received from NACA on drawings for substations "B" and "G" which were sent to NACA for approval. NACA had comments on Mechanical forces

General

Attention: Mr. C. G. Fox - In reference to Bid Schedule Status Report it would be desirable in the Remarks Column wherever possible and available to include date when drawings are sent to contractors Approved or Approved As Noted after receipt of same from Burns and Roe.

SECTION II - See Section II for progress of Contract Drawings.

Progress

The percentages listed below are estimated to be the completion status of the Project as of May 1st, 1950.

		Nos. 33 and 34	Nos. 35 and 36
1.	Operations Building	100%	100%
	Amendment #1	100	100
	Amendment #2	100	100
2.	Altitude Test Chambers	99	99
3.	Shop and Access Building	99	99
4.	Test Air Piping	96	97
	Amendment #3	100	100
5.	Cooling Tower & Circulating Water System	95	95
6.	Fuel Storage and Distribution System	95	95
7.	Electrical Substations	45	55
8.	Equipment Building and Equipment	40	55

DRMcConathy/KBH/LHR/RDK/GHT/WGC/id

DRMcConathy

PROGRESS REPORTS NO. 37 AND 38

36335

Subject: National Advisory Committee for Aeronautics
Propulsion Science Research Laboratory
Project No. 794 (NAw-5652) - B&R W.O. #1218

June 5, 1950

cc:NACA-4
EJT

RCR
RFC
WAB
KAR
WLG-2
RRB-2
MSU
PJM
JBM
AAV-4
KBH-3
WGC-3
RDK-3
LHR-4
GHT
DRM
C. FILES

SECTION I

The following Progress Report will cover the month of May, 1950 and is submitted in the same general form as previous reports.

Item 1 (25,000 KVA Power Transformers)

a) Awaiting drawings from G. E. showing arrangement of cable termination on the low voltage 13.8 KV connection.

Item 3 (Exhauster System With Motors)

a) Drawings received from Roots Connersville showing oil piping for first and second stage right hand units. We require similar drawings for left hand units.

Item 4 (Compressor System With Motors)

a) Please request Elliott to tabulate auxiliaries, with hp requirements for compressors. Please expedite same .

Items 3 and 4 (Compressor and Exhauster Motors)

a) Refer to letter dated May 23rd requesting Elliott design of supports for motor air coolers. No drawings have been received to-date covering the above. Drawings should also indicate door and frame work so that same may be incorporated on the foundations.

Item 6 (Interconnecting Tie Line - Piping)

a) Temporary power will be supplied to motor operator located on the 72" gate valves for the exhauster tie line. Local ontrol on the valve will be provided at this time. Control will be furnished in the future under Primary Electrical Contract, Equipment Building remote manually from the Control Room.

Item 8 (Two Circulating Water Pumps With Motors)

a) Burns and Roe have discussed with NACA the advisability of operating circulating water pumps automatically. The addition of the water treating system has somewhat altered the overall picture. It has been tentatively agreed that pumps will continue to be automatically operated as planned but automatic operation will be used only during periods of circulation when water treatment system is not in operation. A letter is being prepared to clarify our suggestions.

Item 11 (Pressure Control Stations)

a) We still require drawings from Askania Regulator showing motor control panels and wiring diagrams for all electrical equipment furnished by them. We now have drawings for all of the pumps and oil tanks. Contract drawings for instrumentation cannot be started until the above information is received.

Item 14 (Altitude Test Chambers)

a) Recommendations were sent to NACA concerning the hydrostatic testing of the inlet section. The strength of the dished head and the effectiveness of the seal for the flange were investigated and comments were sent to NACA. (See Burns and Roe's letter dated May 26, 1950).

Item 14A. (Special Lighting Fixtures - Altitude Test Chambers)

a) Specifications for these lighting fixtures will be issued by June 25th.

Item 16 (Inter and After Coolers - Spec. Items 1, 3 and 7)

a) We have now received all information from Griscom Russell and recently returned to them approval sketches showing arrangement of condensate pumps.

b) Griscom Russell will revise their arrangement drawings and submit same to NACA for final approval.

Item 17 (Operations Building)

a) Drawings will be brought up to date to include various minor changes as directed from time to time by NACA. This work will not be done until time permits and until final drawings are received from all contractors.

Item 18 (Shop and Access Building)

a) A letter is following commenting on correspondence and quotations with reference to Proposed Change Orders 7, 15, and 17.

b) A Proposed Change Order is being prepared covering accumulated minor changes to the building, such as changes to openings in control room floor and walls, minor relocation of valves, heating and ventilation piping, etc.

c) Require shop drawings for control cubicle outline and wiring drawings. These drawings actually refer to the hatch cover control for the Altitude Test Chamber. Please expedite.

Item 23 (Switchgear and Transformer - C. W. Pump House)

a) Require wiring diagrams and drawings showing nameplate and nomenclature for switchgear.

Item 23B. (Transformer and Motor Control Center - H.P.F.P.H.)

a) Information required on various piping covered in our letter of June 2nd.

Item 24 (Gas Fired Air Heaters)

a) Petro Chem drawings showing arrangement of air heaters and supports were approved on May 29th. As per our letter of May 25th we still require final drawings for control panels, wiring diagrams, etc. which Petro Chem have promised to have ready about July 15th.

b) Temporary power supply will be provided for first stage operation of one gas fired air heater.

c) We have not developed the design of the platform giving access to the bottom of the air heaters. We will prepare a sketch showing an arrangement which we think will be suitable and discuss this matter with you at some future conference.

Item 27 (Variable Frequency Starting and Exciting Equipment)

a) Still awaiting show drawings for slip regulator including sump pit requirements and heat exchanger outline. Please expedite.

Item 29 (Combustion Air Piping System)

a) For comments see Item 54 - Air and Gas Piping.

Item 30 (Circulating Water Piping System)

a) Return of shop drawings being delayed until Change Order at water treating area can be completed. Only 48" and 36" line drawings have been received.

b) Manufacturers' prints of valves and miscellaneous accessories have not yet been received.

Item 31 (Fuel Piping System)

a) Opening date extended to June 9th.

Item 32 (P.H., Exhaust Gas Stack, Pipe Supports and Tank Foundations)

a) Proposed Change Order No. 23 was issued to NACA on May 19th.

b) It is anticipated that the foundations for the vacuum deaerators will be made part of this contract by Change Order.

c) Construction work on the Combustion Air header trench is being delayed until piping arrangement is finally determined.

Item 32A. (H.P. Fuel Pump House)

a) Bids received - awaiting information on award.

Item 33 (Primary Electrical Work - 1st Step Construction)

a) Opening date has been extended to June 9th. It is understood that an Addendum is being issued by NACA to cover fuel distribution controls. Information covering addendum sent NACA on May 31st.

b) Two additional reference drawings covering interconnecting wiring diagrams for the fuel distribution system controls will be issued June 23rd for clarification to the contractor of equipment locations. It may be necessary to issue a Change Order at this time.

Item 35 (Walkways and Stairways - Altitude Chamber and Coolers)

a) Sepias and rough draft of specifications were sent to NACA on June 2nd. Supports for overhead piping to and from gas fired air heaters were originally intended to become a part of this contract but work withheld due to changes to piping.

Item 37 (Thrust Platform and Thrust Transmitting Device)

Awaiting shop drawings.

Item 38 (Panel Boards - Shop and Access Building)
Item 39 (Control and Instrumentation Piping - 1st Step)

a) Insufficient information is available to permit design of this work.

Item 40A. (Zeolite Softening and Chlorination System)

a) Specifications out for bid - awaiting opening.

b) Separate specification to be issued for Chlorination System from draft forwarded by Burns and Roe on June 5th.

Item 40B. (Mixed Flow Booster Pumps)

a) Bids received by NACA on June 2nd. Awaiting information from NACA.

Item 40C. (Vacuum Deaerator System)

a) Specifications and sepia tracings of drawings sufficiently complete for bidding purposes including details of vacuum deaerator tanks, structural steel supports and water piping will be forwarded to Cleveland on June 9th.

Item 40D. (Piping System - Water Treatment Equipment - Small Piping Water Treating)

a) The piping system for water treatment area which includes small piping not included under Item 40C will be available for approval and comments about June 19th.

Item 40F.(Mixed Flow Booster Pumps - Switchgear)

a) Opening date has been extended to June 9th.

Item 42 (Fuel Metering Equipment)

a) Metering equipment purchased from Republic under NACA's specifications.

b) Additional equipment to be purchased by NACA.

Item 43 (Fuel Pressure Control System)

a) NACA negotiating contract with Republic Flow Meter.

Item 48 (Expansion Joints - Combustion Air System)

a) See Item 62A.

Item 50 (Fire Protection - 1st Step)

a) Specifications sent out covering L.P.F.P.H. area. Bid opening is awaited.

Item 50A. (Fire Protection CO2 - Equipment Building)

a) The CO2 system for Equipment Building, Shop and Access Building and H.P. F. P.H. area combined. NACA to send out specifications for this work

b) The fog nozzle system protection for the transformers and regulators at the Equipment Building will be included as a part of the general service piping contract under Item 55.

Item 51 and 52 (Equipment Bldg. SubStructure and Foundations)
(Equipment Building SuperStructure & Bldg. Serv.)

a) Specifications and drawings were issued to bidder on May 12th. Drawings were unsigned and in some cases incomplete.

b) Sepia tracings of architectural, mechanical and electrical drawings were sent to NACA on May 31st. Sepia tracings of incomplete structural drawings showing more advanced design were sent to NACA on June 2nd. All of these drawings are to be issued to bidders by Addendum in order to have price changes included in bids to be opened June 16th.

c) Lighting calculations utilizing 1000 watt lamps for fixtures on operating floor have been sent to NACA. The calculations indicate that the "in" service foot candles will be more than 20. These calculations substantiate our original lighting fixture design. Copies of drawings were received from NACA with comments and suggestions. Same was discussed with NACA representatives on May 31st and certain items have been incorporated on final sepia tracings.

d) Complete structural drawings will be issued by Proposed Change Order after bids are open.

Item 53 (Primary Electrical Work - Equipment Building Area)

a) Refer to Item 72. Require shop drawings for various equipment covered under this item in order to prepare necessary specifications and drawings for electrical work. Electrical information as to hp requirements and control Data for other equipment contracts are also required to complete the Equipment Building electrical work contract.

Item 54 (Air and Gas Piping - Equipment Building and Air Heaters)

a) The work included under Item 29 has now been combined with work classified under Item 54. It has been agreed that the entire combustion air and exhaust piping system will be divided into three (3) parts.

(1) From a point in the Combustion Air lines at the header spaces to the Altitude Chambers.

(2) Piping at the header spaces.

(3) Piping around the air heaters and in the Equipment Building.

Specifications will call for individual prices on these groups in such a way that the header area piping can be deleted from the contract if it is found that major re-design is necessary.

b) Sepia tracings of all drawings covering the Combustion Air Piping system and the exhaust gas piping system in the Equipment Building as well as a combined specification for same will be forwarded on June 7th for issue to contractors for bids.

c) We are making a complete study of the pressure drop from the Combustion Air system from the discharge of the second stage compressors to the inlet of the Altitude Test Chambers based on the drawings to be submitted to contractors as mentioned above. As soon as this study has been completed and tabulated we will submit same to you for comments.

d) We are also making a study of the pressure control and temperature control valves for mixing air at the various pressures and temperatures. As soon as we have prepared sufficient data for this subject we will discuss this with you at a conference.

Item 55 (General Service Piping - Equipment Building Area)

a) Design of the various piping systems is being continued.

b) A flow diagram showing the central lubrication oil system together with a description of same was sent to NACA on May 29th. We are awaiting comments.

c) It has been decided that the fog nozzle system piping for fire protection of transformers and regulators will be included under this item.

Item 56 (Air Drying and Refrigeration)

a) Proposals have been received for air drying and refrigeration systems. Lowest cost proposal was for a mechanical system. Negotiations are now being carried out by NACA to determine the most satisfactory and economical system to purchase.

Item 56A. (Expander Turbine)

a) We are still awaiting revised drawing of expander turbine from Elliott Company. (See our letter of April 25th). We will be unable to complete our drawings for compressor foundations and piping to and from the expander turbine until we receive this information.

Item 56B. (Turbo Expander Controls)

a) No work is being pursued on the expander controls since insufficient data has been received from the manufacturer.

Items 58 and 59 (Compressor System - Controls)
(Exhaust System - Controls)

a) Burns and Roe are awaiting proposal information for compressor and exhauster system controls. This information will directly tie in with the bleeder piping as stated previously. Bleeder Piping - sizes, location, etc. must be determined immediately.

This information has been requested in three consecutive reports.

Item 60 (Check Valves - Exh. and Compressor Systems)

a) Bids scheduled to be open June 2nd. Awaiting information.

Item 61 (Butterfly Valves - Exhaust Gas System)

a) Bids were to be open May 24th. Awaiting information.

Item 62A. (Expansion Joints for Combustion Air System)

a) Item 48 will be combined with Item 62A.

b) At the request of Mr. E. D. Williams, Burns and Roe at a Conference with Mr. J. Zallea in New York on May 26th at which time Mr. Zallea gave his comments on the type and arrangement of joints that we had shown on our drawings.

c) We are incorporating such suggestions Mr. Zallea offered which we considered desirable and are preparing a revised list of the joints and a new set of specifications to be issued to vendors for contract. We expect to have this ready in about a week or ten days.

Item 63 (Combustion Air System Valves)

a) See comments under Item 54 paragraph (d).

Item 65 (Lube Oil System)

a) All information from vendors necessary for designing this system has now been received.

b) A complete description of the central lube oil system was sent to you for your approval or comments on May 29th. In the meantime we are preparing specifications for the various items of equipment which will have to be purchased.

c) We have received from Roots Connersville drawings showing the oil piping for the first and second stage right hand exhausters. We presume they will send us similar drawings for left hand exhausters. The Elliott Company should be instructed to furnish similar drawings showing the oil piping which they will furnish as part of the compressor contract. Please advise when we may expect these drawings.

Item 66 (Building Cranes)

a) Specifications were issued and bids received, however, due to certain inconsistencies, readvertising was necessary. Awaiting receipt of new proposals.

Item 67 (Exh. and Compressor Control Panels)

a) These panels cannot be developed until adequate information is available on exhauster and compressor control systems, under Items 58 and 59.

Item 70 (Misc. Elec. Equipment - Equipment Building Area)

a) Specifications for power and lighting unit substation is in preparation. Draft copy to be issued to NACA July 1.

Item 70A. (Motor Control Centers)

a) Specifications for motor control centers for various auxiliary power supplied in the Equipment Building will be issued around November 1st when sufficient information is available.

Item 72 (Swgr. Control Equipment. Trans. & Aux. - Comp. & Exh. Motors)

a) Refer to letter dated May 25th outlining shop drawing requirements for various equipment listed under this item. It is urgent that switchgear and switchboard equipment outline drawings be obtained as quickly as possible.

Item 73 (34.5 KV Cable Installation)

a) Bid open June 2nd. Burns and Roe awaiting award information.

Item 75 (Substation "B" and "G" Struc. and Equipment)

a) Opening date has been extended to June 9th.

Item 76 (Primary Electrical Work - Substation Area)

a) Specification covering this item in preparation and will be issued about September 1st if sufficient equipment contractor's information is available.

Item 77 (Intercommunication System)

a) Specification for intercommunication system for entire Project to be issued around November 1st.

Item 77A. (Relay Signal System Cabinet
Loop No. 2 Remote Signalling and Recording)

This item has been established to include various installations associated with the signal system. Specifications prepared by NACA have been issued.

Progress

The percentages listed below are estimated to be the completion status of the project as of June 1st, 1950. Work on Amendment #4 and the new contract numbers have been in progress for some time, this being the first period after final approvals.

Contract #NAw-5652	Nos. 35 and 36	Nos. 37 and 38
1. Operations Building	100%	100%
Amendment #1	100	100
Amendment #2	100	100
2. Altitude Test Chambers	99	99
3. Shop and Access Building	99	99
4. Test Air Piping		
Amendment #3	100	100
5. Cooling Tower and Circulating Water System	95	96
6. Fuel Storage and Distribution System	95	96
7. Electrical Substations	55	60
8. Equipment Building and Equipment	55	67
Amendment #4 - Engineering and Design on Water Treatment, Refrigeration and Air Heating System	0	20
Contract #5891		
Detail Design of Vacuum Deaeration System	0	35
Contract #5892		
Engineering Analysis for Combustion Air, Refrigeration and Drying Systems	0	40

See Section II for progress of Contract Drawings

DRMcConathy

DRMcConathy/id

SECTION II - STATUS OF DRAWING LIST

1. The following work contracts have been either awarded or bids opened and in many cases construction is well advanced. The only work remaining to be completed on these tracings is that which might be occasioned by Change Orders or field changes:

Item 13	- Cooling Tower Foundation -	1 drawing
Item 14	- Altitude Test Chambers -	13 drawings
Item 17	- Operations Building -	41 drawings
Item 18	- Shop and Access Building -	41 drawings
Item 25	- Exhaust Gas Duct System (Including 2 reference dwgs) -	5 drawings
Item 30	- Circulating Water Piping System-	8 drawings
Item 31	- Fuel Storage and Distribution System -	7 drawings
Item 32	- Exhaust Stack, Pump House, Tank Foundations, Pipe Supports, Etc-	21 drawings
Item 32A	- High Pressure Fuel Pump House -	9 drawings
Item 37	- Thrust Platform and Transmitting Device -	1 drawing
	Total	147 drawings

2. On the following contracts, sepia tracings and specifications have been forwarded to NACA and work has been either released to bidders or is in process of release. These drawings are complete except for any changes occasioned by Change Orders or Field Changes.

Item 33	- Primary Electrical Work (1st Step) -	14 drawings
Item 35	- Platform, Walkways and Stairways -	4 drawings
Items 51 and 52	- Equipment Building (except structural drawings) -	48 drawings
Item 73	- 34.5 KV Cable Installation -	2 drawings
Item 75	- Substation "B" and "G" -	3 drawings
	Total	71 drawings

3. The following drawings of the contracts indicated have completion status as follows: Completion is dependent upon receipt of information.

Item 29 - (See Item 54 for drawing list)

Item 33 - Reference Drawings for Electrical Contractor's information.

		Nos. 37 and 38
CE-104604 (3412)	Fuel Distribution System Controls Schematic Diagram	80%
CE-104605 (3413)	Fuel Distribution System Controls Interconnection Wiring Diagram Sht. 1	30
CE-104606 (3414)	Fuel Distribution System Controls Interconnection Wiring Diagram Sht. 2	40

Item 32 - Change Order to Contract #NAw-5851

			Nos. 37 and 38
CE-104546	(4415)	Vacuum Deaeration System Concrete Foundation	30%

Item 40C. - Vacuum Deaerators, Structural Supports and Associated Fabricated Piping (CE-104220 to CE-104234)

CE-104220	(2457)	Flow Diagram - Zeolite Treatment Deaeration & Chlorination System	85%
CE-104221	(2450)	Vacuum Deaerator Arrangement - Plans Sections and Details	95
CE-104222	(2451)	Circulating Water Piping at Vacuum Deaerator - Lower Level	50
CE-104223	(2458)	Circulating Water Piping At Vacuum Deaerator - Upper Level	50
CE-104226	(4413)	Vacuum Deaerator Tanks - Steel Supports and Details	65
CE-104227	(4414)	Stairways, Ladders, Bracing and Details	40

Item 40D. - Water Treatment Piping Systems for Zeolite Softening and Vacuum Deaeration (CE-104235 to CE-104244)

CE-104220	(2457)	(Same drawing as in Contract Item 40C.)	
CE-104235	(2452)	General Piping System - Water Treatment Area - Steam, Water and Air	50
CE-104236	(2459)	General Piping System at Zeolite Softeners	85
CE-104735	(4731)	Roof Framing Plan - Sections and Details	95
CE-104736	(4732)	Roof Trusses, Bracing - Sections and Details	95
CE-104737	(4733)	Col. Schedule and Details	95
CE-104738	(4734)	Elec. Mezz. & Control Room Floor Framing - Sections and Details	90
CE-104739	(4735)	Operating Floor Framing Plan, Sections and Details	85
CE-104740	(4736)	Crane Girders - Plans and Details	95
CE-104741	(4737)	Col. Line Elev. - East and West Walls	90
CE-104742	(4738)	Col. Line Elev. - North and South Walls	95
CE-104743	(4746)	Bldg. Found. - Plan, Sections and Details	80
CE-104747	(4747)	Building Foundation Details	80
CE-104748	(4748)	Basement Floor Plan, Outside Ramp and Steps - Sections and Details	85
CE-104749	(4749)	Conc. Encl. for Air Intake and Exhaust Pipe	90
CE-104750	(4750)	Compressor Foundation - Sheet 1	80
CE-104751	(4751)	Compressor Foundation - Sheet 2	70
CE-104752	(4752)	Compressor Foundation - Sheet 3	0

Items 51 & 52 - Equipment Building (Structural Only) Other Trades Complete

Item 40D. (Continued) Nos. 37 and 38

CE-104753	(4753)	1st Stage Exh. Found. - Sheet 1	80%
CE-104754	(4754)	1st Stage Exh. Found. - Sheet 2	70
CE-104755	(4755)	2nd Stage Exh. Found. - Sheet 1	75
CE-104756	(4756)	2nd Stage Exh. Found. - Sheet 2	25
CE-104757	(4757)	2nd Stage Exh. Found. - Sheet 3	50
CE-104758	(4759)	Misc. Conc. Details Sheet 1	75
CE-104759	(4770)	Air Heater Foundations	70
CE-104760	(4771)	Substation "J" Area - Trans. Found.	80
CE-104761	(4772)	Substation "J" Area - Conc. Details and EMH #86	80
CE-104762	(4773)	Refrig. Equip. Found. - Sheet 1	0
CE-104763	(4774)	Refrig. Equip. Found. - Sheet 2	0
CE-104764	(4775)	Steam Trench Ext.	75
CE-104765	(4776)	Misc. Conc. Details - Sheet 2	70

Item 53(and Item 29) Combustion Air and Exhaust Gas Piping Equipment Building, Air Heater Area and to Altitude Test Chamber

CE-104503	(2310)	Combustion Air Piping - Plans, Elevs. and Details - Altitude Test Chamber Area - 1st Step	95
CE-104506	(2313)	Combustion Air Piping - Supports, Anchors and Misc. Details - 1st Step	95
CE-104512	(2716)	Combustion Air and Exhaust Gas Piping Plan	90
CE-104513	(2717)	Combustion Air and Exhaust Gas Piping Cross Sections - North End	90
CE-104514	(2718)	Combustion Air and Gas Piping - Cross Sections South End	90
CE-104515	(2719)	Combustion Air and Gas Piping - Long Sections - Compressor Area	90
CE-104516	(2720)	Combustion Air and Gas Piping - Long Sections - Exhauster Area	90
CE-104517	(2721)	Combustion Air and Exhaust Gas Piping Misc. Elevations and Details	90
CE-104518	(2722)	Combustion Air and Exh. Gas Piping Support Details	90
CE-104519	(4761)	Exhaust Gas Piping Details (Sht. #1)	85
CE-104520	(4762)	Exhaust Gas Piping Details (Sht. #2)	90
CE-104521	(4763)	Combustion Air Piping Details	85
CE-104522	(2723)	Expansion Joint Details for Combustion Air Piping	10
CE-104507	(2314)	Expansion Joint List - Air and Gas Piping	70
CE-104508	(2315)	Valve List - Air and Gas Piping	50

Reference Drawings (Not in Other Contract Drawing Sets)

CE-104500	(2303)	Flow Diagrams - Air & Gas Piping	85
CE-104501	(2301)	General Arrangement Plan (Step 1&2)	85

Reference Drawings (Continued) Nos. 37 and 38

CE-104502	(2302)	General Arrangement Elev.(Step 1&2)	75
CE-104779	(2701)	General Arrangement Plan - Equipment Building - Operating Floor & Control Rm	75
CE-104780	(2702)	General Arrangement Plan (Equipment Building) Basement & Mezz. Floor	75
CE-104781	(2703)	General Arrangement Cross Section Looking North (Equipment Building)	75
CE-104782	(2704)	General Arrangement Cross Section Looking North	75
CE-104783	(2705)	General Arrangement -Long. Section	75
CE-104784	(2706)	General Arrangement -Long. Section	75

Total Drawings in this paragraph-65
Average % Completion -71%

4. The following contracts are anticipated to complete the work for the project. Drawing Lists have not been prepared in all cases but are in process at this time. When work has been started the percentage completion has been indicated.

Item 33A. - Primary Elec. Contract - 1st Step Constr. Additions

CE-104607	(3411)	Water Treatment Extension - Deaerating Tower - Lighting, Grounding and Power	25%
CE-104608	(3415)	Water Treatment Extension - Power	0

Item 36 - Thermal Insulation - 1st Step Construction

1 drawing - Sepia tracing of CE-104503 with notation.

Item 38 - Panel Boards - Shop and Access Building

2 drawings scheduled.

Item 39 - Control and Instrumentation Piping (1st Step)

6 drawings scheduled - Will include all piping for Askania Control System.

Item 49 - Pressure Gages, Thermometers and Test Wells (1st Step)

2 drawings scheduled - may be integrated with Item 39.

Item 53 - Equipment Building - Primary Electrical Contract

3715	Main One Line Diagram	80%
3716	Auxiliary One Line Diagram	75
3717	Cable and Conduit Schedule (Several 11x17 sheets)	30
3718	Plan and Sections Cable Vault (MH #88) Sub. "J"	40

Item 53 (Continued) Nos. 37 and 38

3719	Conduit Plan - Mezzanine	0
3720	Main Floor Conduit Plan & Equip. Grdg. Operating Floor - North	20
3721	Main Floor Conduit Plan & Equip. Grdg. Operating Floor - South	20
3722	Conduit Plan & Equip. Grdg. - Control Room	0
3723	Conduit Details - Sheet 1	10
3724	Conduit Details - Sheet 2	0
3725	Conduit Details - Sheet 3	0
3726	Conduit Details - Sheet 4	0
3727	Telephone & Signal System - Operating Floor	0
3728	Telephone & Signal System - Mezz. & Control Rm	0
3729	Wiring Diagram - Sheet 1	0
3730	Wiring Diagram - Sheet 2	0
3731	Wiring Diagram - Sheet 3	0
3732	Interconnection Wiring Diagram Sheet 1	0
3733	Interconnection Wiring Diagram Sheet 2	0
3734	Annunciator Schematic Diagram	0

Item 55 - General Service Piping - Equip. Bldg. Area

2727	Circ. Water System - Plan - Basement	5
2728	Circ. Water System - Long. Elev. - Looking East	0
2729	Circ. Water System - Elevs. Looking North	0
2730	Circ. Water System - Misc. Elevations & Details	0
2732	Lube Oil System - Flow Diagram	15
2733	Lube Oil System - Plans and Details	10
2734	Lube Oil System - Elevations and Details	0
2735	Lube Oil System - Arrangement of Pump Room Plans and Sections	0
2736	Lube Oil System - Hydraulic Coupling Arrangement Piping	0
2738	Service Air Piping - Plans and Sections	0
2739	Service Air Piping - Elevations and Details	0
2741	Fire Protection-Fog Nozzles @ Transformers and Regulators	0
2742	Fire Protection-Fog Nozzles @ Transformers and Regulators	0
2744	Equipment Drain Piping	0
2745	Equipment Drain Piping	0
2747	Hangers and Supports	0
2748	Hangers and Supports	0

Item 56 - Air Drying and Refrigeration

6 drawings scheduled.

Item 57 - Thermal Insulation (2nd Step) Nos. 37 and 38

2 drawings - Sepia tracings of drawings used in Item 54.

Item 67 - Exhauster and Compressor Control Panels

3 drawings scheduled.

Item 68 - Pressure Gages, Thermometers and Test Wells

2 drawings scheduled - May be combined with Item 68A.

Item 68A. - Control and Instrumentation Piping

10 drawings scheduled.

Item 76 - Primary Electrical Work - Substation Area

CE-102379 (3601)	Substation "G" Lighting, Grounding and Conduit Details	0
CE-102380 (3602)	Substation "B" Grounding and Conduit Details	0
CE-102381 (3604)	Substation "A", "B", "G", and Dispatch Office - Control and Alarm Wiring Diagram - Sheet 1	0
CE-102382 (3605)	Substation "A", "B", "G", and Dispatch Office - Control and Alarm Wiring Diagram - Sheet 2	0

Item 77 - Intercommunication System

3740	System Line Diagram and Feeder Conduits	0
3741	Conduit and Cable Layout and Details - Shop and Access Building No. 2 Area	0
3742	Conduit and Cable Layout and Details - Circulating Water Pump House Area	0
3743	Conduit and Cable Layout and Details-Air and Gas Piping Area	0
3744	Conduit and Cable Layout and Details - Equipment Building Area	0

Item 78 - Installation Contract - Mechanical & Electrical Equipt.

Reference drawings in Equipment Building may be used as Contract Drawings.

SUMMARY OF DRAWINGS (Approximate)	No. of Dwg.	Completion
1. Drawings under Contract - Completed	147	147
2. Drawings completed ready for contract	71	71
3. Drawings being prepared for Contract(71% comp.)	65	46
4. Drawings estimated for completion of project on which little work has been done (5% comp.)	82	4
Total Drawings	365	268
% Completion -	73%	

PROGRESS REPORTS NO. 37 AND 38

36335

Subject: National Advisory Committee for Aeronautics
Propulsion Science Research Laboratory
Project No. 794 (NAw-5652) - B&R W.O. #1218

June 5, 1950

cc: NACA-4
EJT

RCR
RFC
WAB
KAR
WLG-2
RRB-2
MSU
PJM
JBM
AAV-4
KBH-3
WGC-3
RDK-3
LHR-4
GHT
DRM
C. FILES

SECTION I

The following Progress Report will cover the month of May, 1950 and is submitted in the same general form as previous reports.

Item 1 (25,000 KVA Power Transformers)

a) Awaiting drawings from G. E. showing arrangement of cable termination on the low voltage 13.8 KV connection.

Item 3 (Exhauster System With Motors)

a) Drawings received from Roots Connersville showing oil piping for first and second stage right hand units. We require similar drawings for left hand units.

Item 4 (Compressor System With Motors)

a) Please request Elliott to tabulate auxiliaries, with hp requirements for compressors. Please expedite same .

Items 3 and 4 (Compressor and Exhauster Motors)

a) Refer to letter dated May 23rd requesting Elliott design of supports for motor air coolers. No drawings have been received to-date covering the above. Drawings should also indicate door and frame work so that same may be incorporated on the foundations.

Item 6 (Interconnecting Tie Line - Piping)

a) Temporary power will be supplied to motor operator located on the 72" gate valves for the exhauster tie line. Local ontrol on the valve will be provided at this time. Control will be furnished in the future under Primary Electrical Contract, Equipment Building remote manually from the Control Room.

Item 8 (Two Circulating Water Pumps With Motors)

a) Burns and Roe have discussed with NACA the advisability of operating circulating water pumps automatically. The addition of the water treating system has somewhat altered the overall picture. It has been tentatively agreed that pumps will continue to be automatically operated as planned but automatic operation will be used only during periods of circulation when water treatment system is not in operation. A letter is being prepared to clarify our suggestions.

Item 11 (Pressure Control Stations)

a) We still require drawings from Askania Regulator showing motor control panels and wiring diagrams for all electrical equipment furnished by them. We now have drawings for all of the pumps and oil tanks. Contract drawings for instrumentation cannot be started until the above information is received.

Item 14 (Altitude Test Chambers)

a) Recommendations were sent to NACA concerning the hydrostatic testing of the inlet section. The strength of the dished head and the effectiveness of the seal for the flange were investigated and comments were sent to NACA. (See Burns and Roe's letter dated May 26, 1950).

Item 14A. (Special Lighting Fixtures - Altitude Test Chambers)

a) Specifications for these lighting fixtures will be issued by June 25th.

Item 16 (Inter and After Coolers - Spec. Items 1, 3 and 7)

a) We have now received all information from Griscom Russell and recently returned to them approval sketches showing arrangement of condensate pumps.

b) Griscom Russell will revise their arrangement drawings and submit same to NACA for final approval.

Item 17 (Operations Building)

a) Drawings will be brought up to date to include various minor changes as directed from time to time by NACA. This work will not be done until time permits and until final drawings are received from all contractors.

Item 18 (Shop and Access Building)

a) A letter is following commenting on correspondence and quotations with reference to Proposed Change Orders 7, 15, and 17.

b) A Proposed Change Order is being prepared covering accumulated minor changes to the building, such as changes to openings in control room floor and walls, minor relocation of valves, heating and ventilation piping, etc.

c) Require shop drawings for control cubicle outline and wiring drawings. These drawings actually refer to the hatch cover control for the Altitude Test Chamber. Please expedite.

Item 23 (Switchgear and Transformer - C. W. Pump House)

a) Require wiring diagrams and drawings showing nameplate and nomenclature for switchgear.

Item 23B. (Transformer and Motor Control Center - H.P.F.P.H.)

a) Information required on various piping covered in our letter of June 2nd.

Item 24 (Gas Fired Air Heaters)

a) Petro Chem drawings showing arrangement of air heaters and supports were approved on May 29th. As per our letter of May 25th we still require final drawings for control panels, wiring diagrams, etc. which Petro Chem have promised to have ready about July 15th.

b) Temporary power supply will be provided for first stage operation of one gas fired air heater.

c) We have not developed the design of the platform giving access to the bottom of the air heaters. We will prepare a sketch showing an arrangement which we think will be suitable and discuss this matter with you at some future conference.

Item 27 (Variable Frequency Starting and Exciting Equipment)

a) Still awaiting show drawings for slip regulator including sump pit requirements and heat exchanger outline. Please expedite.

Item 29 (Combustion Air Piping System)

a) For comments see Item 54 - Air and Gas Piping.

Item 30 (Circulating Water Piping System)

a) Return of shop drawings being delayed until Change Order at water treating area can be completed. Only 48" and 36" line drawings have been received.

b) Manufacturers' prints of valves and miscellaneous accessories have not yet been received.

Item 31 (Fuel Piping System)

a) Opening date extended to June 9th.

Item 32 (P.H., Exhaust Gas Stack, Pipe Supports and Tank Foundations)

a) Proposed Change Order No. 23 was issued to NACA on May 19th.

b) It is anticipated that the foundations for the vacuum deaerators will be made part of this contract by Change Order.

c) Construction work on the Combustion Air header trench is being delayed until piping arrangement is finally determined.

Item 32A. (H.P. Fuel Pump House)

a) Bids received - awaiting information on award.

Item 33 (Primary Electrical Work - 1st Step Construction)

a) Opening date has been extended to June 9th. It is understood that an Addendum is being issued by NACA to cover fuel distribution controls. Information covering addendum sent NACA on May 31st.

b) Two additional reference drawings covering interconnecting wiring diagrams for the fuel distribution system controls will be issued June 23rd for clarification to the contractor of equipment locations. It may be necessary to issue a Change Order at this time.

Item 35 (Walkways and Stairways - Altitude Chamber and Coolers)

a) Sepias and rough draft of specifications were sent to NACA on June 2nd. Supports for overhead piping to and from gas fired air heaters were originally intended to become a part of this contract but work withheld due to changes to piping.

Item 37 (Thrust Platform and Thrust Transmitting Device)

Awaiting shop drawings.

Item 38 (Panel Boards - Shop and Access Building)
Item 39 (Control and Instrumentation Piping - 1st Step)

a) Insufficient information is available to permit design of this work.

Item 40A. (Zeolite Softening and Chlorination System)

a) Specifications out for bid - awaiting opening.

b) Separate specification to be issued for Chlorination System from draft forwarded by Burns and Roe on June 5th.

Item 40B. (Mixed Flow Booster Pumps)

a) Bids received by NACA on June 2nd. Awaiting information from NACA.

Item 40C. (Vacuum Deaerator System)

a) Specifications and sepia tracings of drawings sufficiently complete for bidding purposes including details of vacuum deaerator tanks, structural steel supports and water piping will be forwarded to Cleveland on June 9th.

Item 40D. (Piping System - Water Treatment Equipment - Small Piping Water Treating)

a) The piping system for water treatment area which includes small piping not included under Item 40C will be available for approval and comments about June 19th.

Item 40F.(Mixed Flow Booster Pumps - Switchgear)

a) Opening date has been extended to June 9th.

Item 42 (Fuel Metering Equipment)

a) Metering equipment purchased from Republic under NACA's specifications.

b) Additional equipment to be purchased by NACA.

Item 43 (Fuel Pressure Control System)

a) NACA negotiating contract with Republic Flow Meter.

Item 48 (Expansion Joints - Combustion Air System)

a) See Item 62A.

Item 50 (Fire Protection - 1st Step)

a) Specifications sent out covering L.P.F.P.H. area. Bid opening is awaited.

Item 50A. (Fire Protection CO2 - Equipment Building)

a) The CO2 system for Equipment Building, Shop and Access Building and H.P. F. P.H. area combined. NACA to send out specifications for this work

b) The fog nozzle system protection for the transformers and regulators at the Equipment Building will be included as a part of the general service piping contract under Item 55.

Item 51 and 52 (Equipment Bldg. SubStructure and Foundations)
(Equipment Building SuperStructure & Bldg. Serv.)

a) Specifications and drawings were issued to bidder on May 12th. Drawings were unsigned and in some cases incomplete.

b) Sepia tracings of architectural, mechanical and electrical drawings were sent to NACA on May 31st. Sepia tracings of incomplete structural drawings showing more advanced design were sent to NACA on June 2nd. All of these drawings are to be issued to bidders by Addendum in order to have price changes included in bids to be opened June 16th.

c) Lighting calculations utilizing 1000 watt lamps for fixtures on operating floor have been sent to NACA. The calculations indicate that the "in" service foot candles will be more than 20. These calculations substantiate our original lighting fixture design. Copies of drawings were received from NACA with comments and suggestions. Same was discussed with NACA representatives on May 31st and certain items have been incorporated on final sepia tracings.

d) Complete structural drawings will be issued by Proposed Change Order after bids are open.

Item 53 (Primary Electrical Work - Equipment Building Area)

a) Refer to Item 72. Require shop drawings for various equipment covered under this item in order to prepare necessary specifications and drawings for electrical work. Electrical information as to hp requirements and control Data for other equipment contracts are also required to complete the Equipment Building electrical work contract.

Item 54 (Air and Gas Piping - Equipment Building and Air Heaters)

a) The work included under Item 29 has now been combined with work classified under Item 54. It has been agreed that the entire combustion air and exhaust piping system will be divided into three (3) parts.

(1) From a point in the Combustion Air lines at the header spaces to the Altitude Chambers.

(2) Piping at the header spaces.

(3) Piping around the air heaters and in the Equipment Building.

Specifications will call for individual prices on these groups in such a way that the header area piping can be deleted from the contract if it is found that major re-design is necessary.

b) Sepia tracings of all drawings covering the Combustion Air Piping system and the exhaust gas piping system in the Equipment Building as well as a combined specification for same will be forwarded on June 7th for issue to contractors for bids.

c) We are making a complete study of the pressure drop from the Combustion Air system from the discharge of the second stage compressors to the inlet of the Altitude Test Chambers based on the drawings to be submitted to contractors as mentioned above. As soon as this study has been completed and tabulated we will submit same to you for comments.

d) We are also making a study of the pressure control and temperature control valves for mixing air at the various pressures and temperatures. As soon as we have prepared sufficient data for this subject we will discuss this with you at a conference.

Item 55 (General Service Piping - Equipment Building Area)

a) Design of the various piping systems is being continued.

b) A flow diagram showing the central lubrication oil system together with a description of same was sent to NACA on May 29th. We are awaiting comments.

c) It has been decided that the fog nozzle system piping for fire protection of transformers and regulators will be included under this item.

Item 56 (Air Drying and Refrigeration)

a) Proposals have been received for air drying and refrigeration systems. Lowest cost proposal was for a mechanical system. Negotiations are now being carried out by NACA to determine the most satisfactory and economical system to purchase.

Item 56A. (Expander Turbine)

a) We are still awaiting revised drawing of expander turbine from Elliott Company. (See our letter of April 25th). We will be unable to complete our drawings for compressor foundations and piping to and from the expander turbine until we receive this information.

Item 56B. (Turbo Expander Controls)

a) No work is being pursued on the expander controls since insufficient data has been received from the manufacturer.

Items 58 and 59 (Compressor System - Controls)
(Exhaust System - Controls)

a) Burns and Roe are awaiting proposal information for compressor and exhauster system controls. This information will directly tie in with the bleeder piping as stated previously. Bleeder Piping - sizes, location, etc. must be determined immediately.

This information has been requested in three consecutive reports.

Item 60 (Check Valves - Exh. and Compressor Systems)

a) Bids scheduled to be open June 2nd. Awaiting information.

Item 61 (Butterfly Valves - Exhaust Gas System)

a) Bids were to be open May 24th. Awaiting information.

Item 62A. (Expansion Joints for Combustion Air System)

a) Item 48 will be combined with Item 62A.

b) At the request of Mr. E. D. Williams, Burns and Roe at a Conference with Mr. J. Zallea in New York on May 26th at which time Mr. Zallea gave his comments on the type and arrangement of joints that we had shown on our drawings.

c) We are incorporating such suggestions Mr. Zallea offered which we considered desirable and are preparing a revised list of the joints and a new set of specifications to be issued to vendors for contract. We expect to have this ready in about a week or ten days.

Item 63 (Combustion Air System Valves)

a) See comments under Item 54 paragraph (d).

Item 65 (Lube Oil System)

a) All information from vendors necessary for designing this system has now been received.

b) A complete description of the central lube oil system was sent to you for your approval or comments on May 29th. In the meantime we are preparing specifications for the various items of equipment which will have to be purchased.

c) We have received from Roots Connersville drawings showing the oil piping for the first and second stage right hand exhausters. We presume they will send us similar drawings for left hand exhausters. The Elliott Company should be instructed to furnish similar drawings showing the oil piping which they will furnish as part of the compressor contract. Please advise when we may expect these drawings.

Item 66 (Building Cranes)

a) Specifications were issued and bids received, however, due to certain inconsistencies, readvertising was necessary. Awaiting receipt of new proposals.

Item 67 (Exh. and Compressor Control Panels)

a) These panels cannot be developed until adequate information is available on exhauster and compressor control systems, under Items 58 and 59.

Item 70 (Misc. Elec. Equipment - Equipment Building Area)

a) Specifications for power and lighting unit substation is in preparation. Draft copy to be issued to NACA July 1.

Item 70A. (Motor Control Centers)

a) Specifications for motor control centers for various auxiliary power supplied in the Equipment Building will be issued around November 1st when sufficient information is available.

Item 72 (Swgr. Control Equipment. Trans. & Aux. - Comp. & Exh. Motors)

a) Refer to letter dated May 25th outlining shop drawing requirements for various equipment listed under this item. It is urgent that switchgear and switchboard equipment outline drawings be obtained as quickly as possible.

Item 73 (34.5 KV Cable Installation)

a) Bid open June 2nd. Burns and Roe awaiting award information.

Item 75 (Substation "B" and "G" Struc. and Equipment)

a) Opening date has been extended to June 9th.

Item 76 (Primary Electrical Work - Substation Area)

a) Specification covering this item in preparation and will be issued about September 1st if sufficient equipment contractor's information is available.

Item 77 (Intercommunication System)

a) Specification for intercommunication system for entire Project to be issued around November 1st.

Item 77A. (Relay Signal System Cabinet
Loop No. 2 Remote Signalling and Recording)

This item has been established to include various installations associated with the signal system. Specifications prepared by NACA have been issued.

Progress

The percentages listed below are estimated to be the completion status of the project as of June 1st, 1950. Work on Amendment #4 and the new contract numbers have been in progress for some time, this being the first period after final approvals.

Contract #NAw-5652	Nos. 35 and 36	Nos. 37 and 38
1. Operations Building	100%	100%
Amendment #1	100	100
Amendment #2	100	100
2. Altitude Test Chambers	99	99
3. Shop and Access Building	99	99
4. Test Air Piping		
Amendment #3	100	100
5. Cooling Tower and Circulating Water System	95	96
6. Fuel Storage and Distribution System	95	96
7. Electrical Substations	55	60
8. Equipment Building and Equipment	55	67
Amendment #4 - Engineering and Design on Water Treatment, Refrigeration and Air Heating System	0	20
Contract #5891		
Detail Design of Vacuum Deaeration System	0	35
Contract #5892		
Engineering Analysis for Combustion Air, Refrigeration and Drying Systems	0	40

See Section II for progress of Contract Drawings

DRMcConathy.

DRMcConathy/id

SECTION II - STATUS OF DRAWING LIST

1. The following work contracts have been either awarded or bids opened and in many cases construction is well advanced. The only work remaining to be completed on these tracings is that which might be occasioned by Change Orders or field changes:

Item 13	- Cooling Tower Foundation -	1 drawing
Item 14	- Altitude Test Chambers -	13 drawings
Item 17	- Operations Building -	41 drawings
Item 18	- Shop and Access Building -	41 drawings
Item 25	- Exhaust Gas Duct System (Including 2 reference dwgs) -	5 drawings
Item 30	- Circulating Water Piping System-	8 drawings
Item 31	- Fuel Storage and Distribution System -	7 drawings
Item 32	- Exhaust Stack, Pump House, Tank Foundations, Pipe Supports, Etc-	21 drawings
Item 32A	- High Pressure Fuel Pump House -	9 drawings
Item 37	- Thrust Platform and Transmitting Device -	1 drawing
	Total	147 drawings

2. On the following contracts, sepia tracings and specifications have been forwarded to NACA and work has been either released to bidders or is in process of release. These drawings are complete except for any changes occasioned by Change Orders or Field Changes.

Item 33	- Primary Electrical Work (1st Step) -	14 drawings
Item 35	- Platform, Walkways and Stairways -	4 drawings
Items 51 and 52	- Equipment Building (except structural drawings) -	48 drawings
Item 73	- 34.5 KV Cable Installation -	2 drawings
Item 75	- Substation "B" and "G" -	3 drawings
	Total	71 drawings

3. The following drawings of the contracts indicated have completion status as follows: Completion is dependent upon receipt of information.

Item 29 - (See Item 54 for drawing list)

Item 33 - Reference Drawings for Electrical Contractor's information.

		Nos. 37 and 38
CE-104604 (3412)	Fuel Distribution System Controls Schematic Diagram	80%
CE-104605 (3413)	Fuel Distribution System Controls Interconnection Wiring Diagram Sht. 1	30
CE-104606 (3414)	Fuel Distribution System Controls Interconnection Wiring Diagram Sht. 2	40

Item 32 - Change Order to Contract #NAw-5851

Nos. 37 and 38

CE-104546	(4415)	Vacuum Deaeration System Concrete Foundation	30%

Item 40C. - Vacuum Deaerators, Structural Supports and Associated Fabricated Piping (CE-104220 to CE-104234)

CE-104220	(2457)	Flow Diagram - Zeolite Treatment Deaeration & Chlorination System	85%
CE-104221	(2450)	Vacuum Deaerator Arrangement - Plans Sections and Details	95
CE-104222	(2451)	Circulating Water Piping at Vacuum Deaerator - Lower Level	50
CE-104223	(2458)	Circulating Water Piping At Vacuum Deaerator - Upper Level	50
CE-104226	(4413)	Vacuum Deaerator Tanks - Steel Supports and Details	65
CE-104227	(4414)	Stairways, Ladders, Bracing and Details	40

Item 40D. - Water Treatment Piping Systems for Zeolite Softening and Vacuum Deaeration (CE-104235 to CE-104244)

CE-104220	(2457)	(Same drawing as in Contract Item 40C.)	
CE-104235	(2452)	General Piping System - Water Treatment Area - Steam, Water and Air	50
CE-104236	(2459)	General Piping System at Zeolite Softeners	85
CE-104735	(4731)	Roof Framing Plan - Sections and Details	95
CE-104736	(4732)	Roof Trusses, Bracing - Sections and Details	95
CE-104737	(4733)	Col. Schedule and Details	95
CE-104738	(4734)	Elec. Mezz. & Control Room Floor Framing - Sections and Details	90
CE-104739	(4735)	Operating Floor Framing Plan, Sections and Details	85
CE-104740	(4736)	Crane Girders - Plans and Details	95
CE-104741	(4737)	Col. Line Elev. - East and West Walls	90
CE-104742	(4738)	Col. Line Elev. - North and South Walls	95
CE-104743	(4746)	Bldg. Found. - Plan, Sections and Details	80
CE-104747	(4747)	Building Foundation Details	80
CE-104748	(4748)	Basement Floor Plan, Outside Ramp and Steps - Sections and Details	85
CE-104749	(4749)	Conc. Encl. for Air Intake and Exhaust Pipe	90
CE-104750	(4750)	Compressor Foundation - Sheet 1	80
CE-104751	(4751)	Compressor Foundation - Sheet 2	70
CE-104752	(4752)	Compressor Foundation - Sheet 3	0

Items 51 and 52 - Equipment Building (Structural Only) Other Trades Complete

Item 40D. (Continued) Nos. 37 and 38

CE-104753	(4753)	1st Stage Exh. Found. - Sheet 1	80%
CE-104754	(4754)	1st Stage Exh. Found. - Sheet 2	70
CE-104755	(4755)	2nd Stage Exh. Found. - Sheet 1	75
CE-104756	(4756)	2nd Stage Exh. Found. - Sheet 2	25
CE-104757	(4757)	2nd Stage Exh. Found. - Sheet 3	50
CE-104758	(4759)	Misc. Conc. Details Sheet 1	75
CE-104759	(4770)	Air Heater Foundations	70
CE-104760	(4771)	Substation "J" Area - Trans. Found.	80
CE-104761	(4772)	Substation "J" Area - Conc. Details and EMH #86	80
CE-104762	(4773)	Refrig. Equip. Found. - Sheet 1	0
CE-104763	(4774)	Refrig. Equip. Found. - Sheet 2	0
CE-104764	(4775)	Steam Trench Ext.	75
CE-104765	(4776)	Misc. Conc. Details - Sheet 2	70

Item 53(and Item 29) Combustion Air and Exhaust Gas Piping Equipment Building, Air Heater Area and to Altitude Test Chamber

CE-104503	(2310)	Combustion Air Piping - Plans, Elevs. and Details - Altitude Test Chamber Area - 1st Step	95
CE-104506	(2313)	Combustion Air Piping - Supports, Anchors and Misc. Details - 1st Step	95
CE-104512	(2716)	Combustion Air and Exhaust Gas Piping Plan	90
CE-104513	(2717)	Combustion Air and Exhaust Gas Piping Cross Sections - North End	90
CE-104514	(2718)	Combustion Air and Gas Piping - Cross Sections South End	90
CE-104515	(2719)	Combustion Air and Gas Piping - Long Sections - Compressor Area	90
CE-104516	(2720)	Combustion Air and Gas Piping - Long Sections - Exhauster Area	90
CE-104517	(2721)	Combustion Air and Exhaust Gas Piping Misc. Elevations and Details	90
CE-104518	(2722)	Combustion Air and Exh. Gas Piping Support Details	90
CE-104519	(4761)	Exhaust Gas Piping Details (Sht. #1)	85
CE-104520	(4762)	Exhaust Gas Piping Details (Sht. #2)	90
CE-104521	(4763)	Combustion Air Piping Details	85
CE-104522	(2723)	Expansion Joint Details for Combustion Air Piping	10
CE-104507	(2314)	Expansion Joint List - Air and Gas Piping	70
CE-104508	(2315)	Valve List - Air and Gas Piping	50

Reference Drawings (Not in Other Contract Drawing Sets)

CE-104500	(2303)	Flow Diagrams - Air & Gas Piping	85
CE-104501	(2301)	General Arrangement Plan (Step 1&2)	85

Reference Drawings (Continued) Nos. 37 and 38

CE-104502 (2302)	General Arrangement Elev.(Step 1&2)	75
CE-104779 (2701)	General Arrangement Plan - Equipment Building - Operating Floor & Control Rm	75
CE-104780 (2702)	General Arrangement Plan (Equipment Building) Basement & Mezz. Floor	75
CE-104781 (2703)	General Arrangement Cross Section Looking North (Equipment Building)	75
CE-104782 (2704)	General Arrangement Cross Section Looking North	75
CE-104783 (2705)	General Arrangement -Long. Section	75
CE-104784 (2706)	General Arrangement -Long. Section	75

Total Drawings in this paragraph-65
Average % Completion -71%

4. The following contracts are anticipated to complete the work for the project. Drawing Lists have not been prepared in all cases but are in process at this time. When work has been started the percentage completion has been indicated.

Item 33A. - Primary Elec. Contract - 1st Step Constr. Additions

CE-104607 (3411)	Water Treatment Extension - Deaerating Tower - Lighting, Grounding and Power	25%
CE-104608 (3415)	Water Treatment Extension - Power	0

Item 36 - Thermal Insulation - 1st Step Construction

1 drawing - Sepia tracing of CE-104503 with notation.

Item 38 - Panel Boards - Shop and Access Building

2 drawings scheduled.

Item 39 - Control and Instrumentation Piping (1st Step)

6 drawings scheduled - Will include all piping for Askania Control System.

Item 49 - Pressure Gages, Thermometers and Test Wells (1st Step)

2 drawings scheduled - may be integrated with Item 39.

Item 53 - Equipment Building - Primary Electrical Contract

3715	Main One Line Diagram	80%
3716	Auxiliary One Line Diagram	75
3717	Cable and Conduit Schedule (Several 11x17 sheets)	30
3718	Plan and Sections Cable Vault (MH #88) Sub. "J"	40

Item 53 (Continued) Nos. 37 and 38

3719	Conduit Plan - Mezzanine	0
3720	Main Floor Conduit Plan & Equip. Grdg. Operating Floor - North	20
3721	Main Floor Conduit Plan & Equip. Grdg. Operating Floor - South	20
3722	Conduit Plan & Equip. Grdg. - Control Room	0
3723	Conduit Details - Sheet 1	10
3724	Conduit Details - Sheet 2	0
3725	Conduit Details - Sheet 3	0
3726	Conduit Details - Sheet 4	0
3727	Telephone & Signal System - Operating Floor	0
3728	Telephone & Signal System - Mezz. & Control Rm	0
3729	Wiring Diagram - Sheet 1	0
3730	Wiring Diagram - Sheet 2	0
3731	Wiring Diagram - Sheet 3	0
3732	Interconnection Wiring Diagram Sheet 1	0
3733	Interconnection Wiring Diagram Sheet 2	0
3734	Annunciator Schematic Diagram	0

Item 55 - General Service Piping - Equip. Bldg. Area

2727	Circ. Water System - Plan - Basement	5
2728	Circ. Water System - Long. Elev. - Looking East	0
2729	Circ. Water System - Elevs. Looking North	0
2730	Circ. Water System - Misc. Elevations & Details	0
2732	Lube Oil System - Flow Diagram	15
2733	Lube Oil System - Plans and Details	10
2734	Lube Oil System - Elevations and Details	0
2735	Lube Oil System - Arrangement of Pump Room Plans and Sections	0
2736	Lube Oil System - Hydraulic Coupling Arrangement Piping	0
2738	Service Air Piping - Plans and Sections	0
2739	Service Air Piping - Elevations and Details	0
2741	Fire Protection-Fog Nozzles @ Transformers and Regulators	0
2742	Fire Protection-Fog Nozzles @ Transformers and Regulators	0
2744	Equipment Drain Piping	0
2745	Equipment Drain Piping	0
2747	Hangers and Supports	0
2748	Hangers and Supports	0

Item 56 - Air Drying and Refrigeration

6 drawings scheduled.

Item 57 - Thermal Insulation (2nd Step) Nos. 37 and 38

2 drawings - Sepia tracings of drawings used in Item 54.

Item 67 - Exhauster and Compressor Control Panels

3 drawings scheduled.

Item 68 - Pressure Gages, Thermometers and Test Wells

2 drawings scheduled - May be combined with Item 68A.

Item 68A. - Control and Instrumentation Piping

10 drawings scheduled.

Item 76 - Primary Electrical Work - Substation Area

CE-102379 (3601)	Substation "G" Lighting, Grounding and Conduit Details	0
CE-102380 (3602)	Substation "B" Grounding and Conduit Details	0
CE-102381 (3604)	Substation "A", "B", "G", and Dispatch Office - Control and Alarm Wiring Diagram - Sheet 1	0
CE-102382 (3605)	Substation "A", "B", "G", and Dispatch Office - Control and Alarm Wiring Diagram - Sheet 2	0

Item 77 - Intercommunication System

3740	System Line Diagram and Feeder Conduits	0
3741	Conduit and Cable Layout and Details - Shop and Access Building No. 2 Area	0
3742	Conduit and Cable Layout and Details - Circulating Water Pump House Area	0
3743	Conduit and Cable Layout and Details-Air and Gas Piping Area	0
3744	Conduit and Cable Layout and Details - Equipment Building Area	0

Item 78 - Installation Contract - Mechanical & Electrical Equipt.

Reference drawings in Equipment Building may be used as Contract Drawings.

SUMMARY OF DRAWINGS (Approximate)	No. of Dwg.	Completion
1. Drawings under Contract - Completed	147	147
2. Drawings completed ready for contract	71	71
3. Drawings being prepared for Contract(71% comp.)	65	46
4. Drawings estimated for completion of project on which little work has been done (5% comp.)	82	4
Total Drawings	365	268
% Completion -	73%	

CC- RFC
CC- DRM

BURNS AND ROE, INC.
ENGINEERING CONSULTANTS
233 BROADWAY
NEW YORK 7, N. Y.
TEL. BARCLAY 7-5900

Snider

36460

June 9, 1950.

Representative of the Contracting Officer
National Advisory Committee for Aeronautics
Lewis Flight Propulsion Laboratory
Cleveland Airport
Cleveland 11, Ohio

file

SUBJECT: Progress Reports No. 37 and 38

Dear Sir:

In line with established procedure, we are enclosing two (2) marked copies of the above Progress Reports.

You will find nineteen (19) items underlined in red crayon to indicate the items on which a drawing or additional information is required. Three (3) of these items appearing respectively on Pages 1, 3 and 4 request that the receipt of the information be expedited.

You will be particularly interested to note the heavily marked item on Page 8 and the fact that this information has been requested in three consecutive reports.

Will you please have these items checked in your organization and the proper marginal notations made on one copy which is to be returned to Mr. D. R. McConathy.

Cordially yours,

BURNS AND ROE, INC.

W. L. Glenzing

Commercial Manager

WLGlenzing/dcl
Enclosures - 2

RECEIVED

3646c

PROGRESS REPORTS NO. 37 AND 38

Subject: National Advisory Committee for Aeronautics
Propulsion Science Research Laboratory
Project No. 794 (NAw-5652) - B&R W.O. #1218

June 5, 1950

cc: NACA-4
EJT
RCR
RFC
WAB
KAR
WLG-2
RRB-2
MSU
PJM
JBM
AAV-4
KBH-3
WGC-3
RDK-3
LHR-4
GHT
DRM
C. FILES

SECTION I

The following Progress Report will cover the month of May, 1950 and is submitted in the same general form as previous reports.

Item 1 (25,000 KVA Power Transformers)

a) Awaiting drawings from G. E. showing arrangement of cable termination on the low voltage 13.8 KV connection.

Item 3 (Exhauster System With Motors)

a) Drawings received from Roots Connersville showing oil piping for first and second stage right hand units. We require similar drawings for left hand units.

Item 4 (Compressor System With Motors)

a) Please request Elliott to tabulate auxiliaries, with hp requirements for compressors. Please expedite same.

Items 3 and 4 (Compressor and Exhauster Motors)

a) Refer to letter dated May 23rd requesting Elliott design of supports for motor air coolers. No drawings have been received to-date covering the above. Drawings should also indicate door and frame work so that same may be incorporated on the foundations.

Item 6 (Interconnecting Tie Line - Piping)

a) Temporary power will be supplied to motor operator located on the 72" gate valves for the exhauster tie line. Local ontrol on the valve will be provided at this time. Control will be furnished in the future under Primary Electrical Contract, Equipment Building remote manually from the Control Room.

Item 8 (Two Circulating Water Pumps With Motors)

a) Burns and Roe have discussed with NACA the advisability of operating circulating water pumps automatically. The addition of the water treating system has somewhat altered the overall picture. It has been tentatively agreed that pumps will continue to be automatically operated as planned but automatic operation will be used only during periods of circulation when water treatment system is not in operation. A letter is being prepared to clarify our suggestions.

Item 11 (Pressure Control Stations)

a) We still require drawings from Askania Regulator showing motor control panels and wiring diagrams for all electrical equipment furnished by them. We now have drawings for all of the pumps and oil tanks. Contract drawings for instrumentation cannot be started until the above information is received.

Item 14 (Altitude Test Chambers)

a) Recommendations were sent to NACA concerning the hydrostatic testing of the inlet section. The strength of the dished head and the effectiveness of the seal for the flange were investigated and comments were sent to NACA. (See Burns and Roe's letter dated May 26, 1950).

Item 14A. (Special Lighting Fixtures - Altitude Test Chambers)

a) Specifications for these lighting fixtures will be issued by June 25th.

Item 16 (Inter and After Coolers - Spec. Items 1, 3 and 7)

a) We have now received all information from Griscom Russell and recently returned to them approval sketches showing arrangement of condensate pumps.

b) Griscom Russell will revise their arrangement drawings and submit same to NACA for final approval.

Item 17 (Operations Building)

a) Drawings will be brought up to date to include various minor changes as directed from time to time by NACA. This work will not be done until time permits and until final drawings are received from all contractors.

Item 18 (Shop and Access Building)

a) A letter is following commenting on correspondence and quotations with reference to Proposed Change Orders 7, 15, and 17.

b) A Proposed Change Order is being prepared covering accumulated minor changes to the building, such as changes to openings in control room floor and walls, minor relocation of valves, heating and ventilation piping, etc.

c) Require shop drawings for control cubicle outline and wiring drawings. These drawings actually refer to the hatch cover control for the Altitude Test Chamber. Please expedite.

Item 23 (Switchgear and Transformer - C. W. Pump House)

a) Require wiring diagrams and drawings showing nameplate and nomenclature for switchgear.

Item 23B. (Transformer and Motor Control Center - H.P.F.P.H.)

a) Information required on various piping covered in our letter of June 2nd.

Item 24 (Gas Fired Air Heaters)

a) Petro Chem drawings showing arrangement of air heaters and supports were approved on May 29th. As per our letter of May 25th we still require final drawings for control panels, wiring diagrams, etc. which Petro Chem have promised to have ready about July 15th.

b) Temporary power supply will be provided for first stage operation of one gas fired air heater.

c) We have not developed the design of the platform giving access to the bottom of the air heaters. We will prepare a sketch showing an arrangement which we think will be suitable and discuss this matter with you at some future conference.

Item 27 (Variable Frequency Starting and Exciting Equipment)

a) Still awaiting show drawings for slip regulator including sump pit requirements and heat exchanger outline. Please expedite.

Item 29 (Combustion Air Piping System)

a) For comments see Item 54 - Air and Gas Piping.

Item 30 (Circulating Water Piping System)

a) Return of shop drawings being delayed until Change Order at water treating area can be completed. Only 48" and 36" line drawings have been received.

b) Manufacturers' prints of valves and miscellaneous accessories have not yet been received.

Item 31 (Fuel Piping System)

a) Opening date extended to June 9th.

Item 32 (P.H., Exhaust Gas Stack, Pipe Supports and Tank Foundations)

a) Proposed Change Order No. 23 was issued to NACA on May 19th.

b) It is anticipated that the foundations for the vacuum deaerators will be made part of this contract by Change Order.

c) Construction work on the Combustion Air header trench is being delayed until piping arrangement is finally determined.

Item 32A. (H.P. Fuel Pump House)

a) Bids received - awaiting information on award.

Item 33 (Primary Electrical Work - 1st Step Construction)

a) Opening date has been extended to June 9th. It is understood that an Addendum is being issued by NACA to cover fuel distribution controls. Information covering addendum sent NACA on May 31st.

b) Two additional reference drawings covering interconnecting wiring diagrams for the fuel distribution system controls will be issued June 23rd for clarification to the contractor of equipment locations. It may be necessary to issue a Change Order at this time.

Item 35 (Walkways and Stairways - Altitude Chamber and Coolers)

a) Sepias and rough draft of specifications were sent to NACA on June 2nd. Supports for overhead piping to and from gas fired air heaters were originally intended to become a part of this contract but work withheld due to changes to piping.

Item 37 (Thrust Platform and Thrust Transmitting Device)

Awaiting shop drawings.

Item 38 (Panel Boards - Shop and Access Building)
Item 39 (Control and Instrumentation Piping - 1st Step)

a) Insufficient information is available to permit design of this work.

Item 40A. (Zeolite Softening and Chlorination System)

a) Specifications out for bid - awaiting opening.

b) Separate specification to be issued for Chlorination System from draft forwarded by Burns and Roe on June 5th.

Item 40B. (Mixed Flow Booster Pumps)

a) Bids received by NACA on June 2nd. Awaiting information from NACA.

Item 40C. (Vacuum Deaerator System)

a) Specifications and sepia tracings of drawings sufficiently complete for bidding purposes including details of vacuum deaerator tanks, structural steel supports and water piping will be forwarded to Cleveland on June 9th.

Item 40D. (Piping System - Water Treatment Equipment - Small Piping Water Treating)

a) The piping system for water treatment area which includes small piping not included under Item 40C will be available for approval and comments about June 19th.

Item 40F.(Mixed Flow Booster Pumps - Switchgear)

a) Opening date has been extended to June 9th.

Item 42 (Fuel Metering Equipment)

a) Metering equipment purchased from Republic under NACA's specifications.

b) Additional equipment to be purchased by NACA.

Item 43 (Fuel Pressure Control System)

a) NACA negotiating contract with Republic Flow Meter.

Item 48 (Expansion Joints - Combustion Air System)

a) See Item 62A.

Item 50 (Fire Protection - 1st Step)

a) Specifications sent out covering L.P.F.P.H. area. Bid opening is awaited.

Item 50A. (Fire Protection CO2 - Equipment Building)

a) The CO2 system for Equipment Building, Shop and Access Building and H.P. F. P.H. area combined. NACA to send out specifications for this work

b) The fog nozzle system protection for the transformers and regulators at the Equipment Building will be included as a part of the general service piping contract under Item 55.

Item 51 and 52 (Equipment Bldg. SubStructure and Foundations)
(Equipment Building SuperStructure & Bldg. Serv.)

a) Specifications and drawings were issued to bidder on May 12th. Drawings were unsigned and in some cases incomplete.

b) Sepia tracings of architectural, mechanical and electrical drawings were sent to NACA on May 31st. Sepia tracings of incomplete structural drawings showing more advanced design were sent to NACA on June 2nd. All of these drawings are to be issued to bidders by Addendum in order to have price changes included in bids to be opened June 16th.

c) Lighting calculations utilizing 1000 watt lamps for fixtures on operating floor have been sent to NACA. The calculations indicate that the "in" service foot candles will be more than 20. These calculations substantiate our original lighting fixture design. Copies of drawings were received from NACA with comments and suggestions. Same was discussed with NACA representatives on May 31st and certain items have been incorporated on final sepia tracings.

d) Complete structural drawings will be issued by Proposed Change Order after bids are open.

Item 53 (Primary Electrical Work - Equipment Building Area)

a) Refer to Item 72. Require shop drawings for various equipment covered under this item in order to prepare necessary specifications and drawings for electrical work. Electrical information as to hp requirements and control Data for other equipment contracts are also required to complete the Equipment Building electrical work contract.

Item 54 (Air and Gas Piping - Equipment Building and Air Heaters)

a) The work included under Item 29 has now been combined with work classified under Item 54. It has been agreed that the entire combustion air and exhaust piping system will be divided into three (3) parts.

(1) From a point in the Combustion Air lines at the header spaces to the Altitude Chambers.

(2) Piping at the header spaces.

(3) Piping around the air heaters and in the Equipment Building.

Specifications will call for individual prices on these groups in such a way that the header area piping can be deleted from the contract if it is found that major re-design is necessary.

b) Sepia tracings of all drawings covering the Combustion Air Piping system and the exhaust gas piping system in the Equipment Building as well as a combined specification for same will be forwarded on June 7th for issue to contractors for bids.

c) We are making a complete study of the pressure drop from the Combustion Air system from the discharge of the second stage compressors to the inlet of the Altitude Test Chambers based on the drawings to be submitted to contractors as mentioned above. As soon as this study has been completed and tabulated we will submit same to you for comments.

d) We are also making a study of the pressure control and temperature control valves for mixing air at the various pressures and temperatures. As soon as we have prepared sufficient data for this subject we will discuss this with you at a conference.

Item 55 (General Service Piping - Equipment Building Area)

a) Design of the various piping systems is being continued.

b) A flow diagram showing the central lubrication oil system together with a description of same was sent to NACA on May 29th. We are awaiting comments.

c) It has been decided that the fog nozzle system piping for fire protection of transformers and regulators will be included under this item.

Item 56 (Air Drying and Refrigeration)

a) Proposals have been received for air drying and refrigeration systems. Lowest cost proposal was for a mechanical system. Negotiations are now being carried out by NACA to determine the most satisfactory and economical system to purchase.

Item 56A. (Expander Turbine)

a) We are still awaiting revised drawing of expander turbine from Elliott Company. (See our letter of April 25th). We will be unable to complete our drawings for compressor foundations and piping to and from the expander turbine until we receive this information.

Item 56B. (Turbo Expander Controls)

a) No work is being pursued on the expander controls since insufficient data has been received from the manufacturer.

Items 58 and 59 (Compressor System - Controls)
(Exhaust System - Controls)

a) Burns and Roe are awaiting proposal information for compressor and exhauster system controls. This information will directly tie in with the bleeder piping as stated previously. Bleeder Piping - sizes, location, etc. must be determined immediately.

This information has been requested in three consecutive reports.

Item 60 (Check Valves - Exh. and Compressor Systems)

a) Bids scheduled to be open June 2nd. Awaiting information.

Item 61 (Butterfly Valves - Exhaust Gas System)

a) Bids were to be open May 24th. Awaiting information.

Item 62A. (Expansion Joints for Combustion Air System)

a) Item 48 will be combined with Item 62A.

b) At the request of Mr. E. D. Williams, Burns and Roe at a Conference with Mr. J. Zallea in New York on May 26th at which time Mr. Zallea gave his comments on the type and arrangement of joints that we had shown on our drawings.

c) We are incorporating such suggestions Mr. Zallea offered which we considered desirable and are preparing a revised list of the joints and a new set of specifications to be issued to vendors for contract. We expect to have this ready in about a week or ten days.

Item 63 (Combustion Air System Valves)

a) See comments under Item 54 paragraph (d).

Item 65 (Lube Oil System)

a) All information from vendors necessary for designing this system has now been received.

b) A complete description of the central lube oil system was sent to you for your approval or comments on May 29th. In the meantime we are preparing specifications for the various items of equipment which will have to be purchased.

c) We have received from Roots Connersville drawings showing the oil piping for the first and second stage right hand exhausters. We presume they will send us similar drawings for left hand exhausters. The Elliott Company should be instructed to furnish similar drawings showing the oil piping which they will furnish as part of the compressor contract. Please advise when we may expect these drawings.

Item 66 (Building Cranes)

a) Specifications were issued and bids received, however, due to certain inconsistencies, readvertising was necessary. Awaiting receipt of new proposals.

Item 67 (Exh. and Compressor Control Panels)

a) These panels cannot be developed until adequate information is available on exhauster and compressor control systems, under Items 58 and 59.

Item 70 (Misc. Elec. Equipment - Equipment Building Area)

a) Specifications for power and lighting unit substation is in preparation. Draft copy to be issued to NACA July 1.

Item 70A. (Motor Control Centers)

a) Specifications for motor control centers for various auxiliary power supplied in the Equipment Building will be issued around November 1st when sufficient information is available.

Item 72 (Swgr. Control Equipment. Trans. & Aux. - Comp. & Exh. Motors)

a) Refer to letter dated May 25th outlining shop drawing requirements for various equipment listed under this item. It is urgent that switchgear and switchboard equipment outline drawings be obtained as quickly as possible.

Item 73 (34.5 KV Cable Installation)

a) Bid open June 2nd. Burns and Roe awaiting award information.

Item 75 (Substation "B" and "G" Struc. and Equipment)

a) Opening date has been extended to June 9th.

Item 76 (Primary Electrical Work - Substation Area)

a) Specification covering this item in preparation and will be issued about September 1st if sufficient equipment contractor's information is available.

Item 77 (Intercommunication System)

a) Specification for intercommunication system for entire Project to be issued around November 1st.

Item 77A. (Relay Signal System Cabinet
Loop No. 2 Remote Signalling and Recording)

This item has been established to include various installations associated with the signal system. Specifications prepared by NACA have been issued.

Progress

The percentages listed below are estimated to be the completion status of the project as of June 1st, 1950. Work on Amendment #4 and the new contract numbers have been in progress for some time, this being the first period after final approvals.

Contract #NAw-5652	Nos. 35 and 36	Nos. 37 and 38
1. Operations Building	100%	100%
Amendment #1	100	100
Amendment #2	100	100
2. Altitude Test Chambers	99	99
3. Shop and Access Building	99	99
4. Test Air Piping		
Amendment #3	100	100
5. Cooling Tower and Circulating Water System	95	96
6. Fuel Storage and Distribution System	95	96
7. Electrical Substations	55	60
8. Equipment Building and Equipment	55	67
Amendment #4 - Engineering and Design on Water Treatment, Refrigeration and Air Heating System	0	20
Contract #5891		
Detail Design of Vacuum Deaeration System	0	35
Contract #5892		
Engineering Analysis for Combustion Air, Refrigeration and Drying Systems	0	40

See Section II for progress of Contract Drawings

DRMcConathy.

DRMcConathy/id

Item 32 - Change Order to Contract #NAw-5851

Nos. 37 and 38

CE-104546	(4415)	Vacuum Deaeration System Concrete Foundation	30%

Item 40C. - Vacuum Deaerators, Structural Supports and Associated Fabricated Piping (CE-104220 to CE-104234)

CE-104220	(2457)	Flow Diagram - Zeolite Treatment Deaeration & Chlorination System	85%
CE-104221	(2450)	Vacuum Deaerator Arrangement - Plans Sections and Details	95
CE-104222	(2451)	Circulating Water Piping at Vacuum Deaerator - Lower Level	50
CE-104223	(2458)	Circulating Water Piping At Vacuum Deaerator - Upper Level	50
CE-104226	(4413)	Vacuum Deaerator Tanks - Steel Supports and Details	65
CE-104227	(4414)	Stairways, Ladders, Bracing and Details	40

Item 40D. - Water Treatment Piping Systems for Zeolite Softening and Vacuum Deaeration (CE-104235 to CE-104244)

CE-104220	(2457)	(Same drawing as in Contract Item 40C.)	
CE-104235	(2452)	General Piping System - Water Treatment Area - Steam, Water and Air	50
CE-104236	(2459)	General Piping System at Zeolite Softeners	85
CE-104735	(4731)	Roof Framing Plan - Sections and Details	95
CE-104736	(4732)	Roof Trusses, Bracing - Sections and Details	95
CE-104737	(4733)	Col. Schedule and Details	95
CE-104738	(4734)	Elec. Mezz. & Control Room Floor Framing - Sections and Details	90
CE-104739	(4735)	Operating Floor Framing Plan, Sections and Details	85
CE-104740	(4736)	Crane Girders - Plans and Details	95
CE-104741	(4737)	Col. Line Elev. - East and West Walls	90
CE-104742	(4738)	Col. Line Elev. - North and South Walls	95
CE-104743	(4746)	Bldg. Found. - Plan, Sections and Details	80
CE-104747	(4747)	Building Foundation Details	80
CE-104748	(4748)	Basement Floor Plan, Outside Ramp and Steps - Sections and Details	85
CE-104749	(4749)	Conc. Encl. for Air Intake and Exhaust Pipe	90
CE-104750	(4750)	Compressor Foundation - Sheet 1	80
CE-104751	(4751)	Compressor Foundation - Sheet 2	70
CE-104752	(4752)	Compressor Foundation - Sheet 3	0

Item 40D. (Continued) Nos. 37 and 38

CE-104753	(4753) 1st Stage Exh. Found. - Sheet 1	80%
CE-104754	(4754) 1st Stage Exh. Found. - Sheet 2	70
CE-104755	(4755) 2nd Stage Exh. Found. - Sheet 1	75
CE-104756	(4756) 2nd Stage Exh. Found. - Sheet 2	25
CE-104757	(4757) 2nd Stage Exh. Found. - Sheet 3	50
CE-104758	(4759) Misc. Conc. Details Sheet 1	75
CE-104759	(4770) Air Heater Foundations	70
CE-104760	(4771) Substation "J" Area - Trans. Found.	80
CE-104761	(4772) Substation "J" Area - Conc. Details and EMH #86	80
CE-104762	(4773) Refrig. Equip. Found. - Sheet 1	0
CE-104763	(4774) Refrig. Equip. Found. - Sheet 2	0
CE-104764	(4775) Steam Trench Ext.	75
CE-104765	(4776) Misc. Conc. Details - Sheet 2	70

Item 53(and Item 29) Combustion Air and Exhaust Gas Piping Equipment Building, Air Heater Area and to Altitude Test Chamber

CE-104503	(2310) Combustion Air Piping - Plans, Elevs. and Details - Altitude Test Chamber Area - 1st Step	95
CE-104506	(2313) Combustion Air Piping - Supports, Anchors and Misc. Details - 1st Step	95
CE-104512	(2716) Combustion Air and Exhaust Gas Piping Plan	90
CE-104513	(2717) Combustion Air and Exhaust Gas Piping Cross Sections - North End	90
CE-104514	(2718) Combustion Air and Gas Piping - Cross Sections South End	90
CE-104515	(2719) Combustion Air and Gas Piping - Long Sections - Compressor Area	90
CE-104516	(2720) Combustion Air and Gas Piping - Long Sections - Exhauster Area	90
CE-104517	(2721) Combustion Air and Exhaust Gas Piping Misc. Elevations and Details	90
CE-104518	(2722) Combustion Air and Exh. Gas Piping Support Details	90
CE-104519	(4761) Exhaust Gas Piping Details (Sht. #1)	85
CE-104520	(4762) Exhaust Gas Piping Details (Sht. #2)	90
CE-104521	(4763) Combustion Air Piping Details	85
CE-104522	(2723) Expansion Joint Details for Combustion Air Piping	10
CE-104507	(2314) Expansion Joint List - Air and Gas Piping	70
CE-104508	(2315) Valve List - Air and Gas Piping	50

Reference Drawings (Not in Other Contract Drawing Sets)

CE-104500	(2303) Flow Diagrams - Air & Gas Piping	85
CE-104501	(2301) General Arrangement Plan (Step 1&2)	85

Reference Drawings (Continued) Nos. 37 and 38

CE-104502 (2302)	General Arrangement Elev.(Step 1&2)	75
CE-104779 (2701)	General Arrangement Plan - Equipment Building - Operating Floor & Control Rm	75
CE-104780 (2702)	General Arrangement Plan (Equipment Building) Basement & Mezz. Floor	75
CE-104781 (2703)	General Arrangement Cross Section Looking North (Equipment Building)	75
CE-104782 (2704)	General Arrangement Cross Section Looking North	75
CE-104783 (2705)	General Arrangement -Long. Section	75
CE-104784 (2706)	General Arrangement -Long. Section	75

Total Drawings in this paragraph-65
Average % Completion -71%

4. The following contracts are anticipated to complete the work for the project. Drawing Lists have not been prepared in all cases but are in process at this time. When work has been started the percentage completion has been indicated.

Item 33A. - Primary Elec. Contract - 1st Step Constr. Additions

CE-104607 (3411)	Water Treatment Extension - Deaerating Tower - Lighting, Grounding and Power	25%
CE-104608 (3415)	Water Treatment Extension - Power	0

Item 36 - Thermal Insulation - 1st Step Construction

1 drawing - Sepia tracing of CE-104503 with notation.

Item 38 - Panel Boards - Shop and Access Building

2 drawings scheduled.

Item 39 - Control and Instrumentation Piping (1st Step)

6 drawings scheduled - Will include all piping for Askania Control System.

Item 49 - Pressure Gages, Thermometers and Test Wells (1st Step)

2 drawings scheduled - may be integrated with Item 39.

Item 53 - Equipment Building - Primary Electrical Contract

3715	Main One Line Diagram	80%
3716	Auxiliary One Line Diagram	75
3717	Cable and Conduit Schedule (Several 11x17 sheets)	30
3718	Plan and Sections Cable Vault (MH #88) Sub. "J"	40

Item 53 (Continued) Nos. 37 and 38

3719	Conduit Plan - Mezzanine	0
3720	Main Floor Conduit Plan & Equip. Grdg. Operating Floor - North	20
3721	Main Floor Conduit Plan & Equip. Grdg. Operating Floor - South	20
3722	Conduit Plan & Equip. Grdg. - Control Room	0
3723	Conduit Details - Sheet 1	10
3724	Conduit Details - Sheet 2	0
3725	Conduit Details - Sheet 3	0
3726	Conduit Details - Sheet 4	0
3727	Telephone & Signal System - Operating Floor	0
3728	Telephone & Signal System - Mezz. & Control Rm	0
3729	Wiring Diagram - Sheet 1	0
3730	Wiring Diagram - Sheet 2	0
3731	Wiring Diagram - Sheet 3	0
3732	Interconnection Wiring Diagram Sheet 1	0
3733	Interconnection Wiring Diagram Sheet 2	0
3734	Annunciator Schematic Diagram	0

Item 55 - General Service Piping - Equip. Bldg. Area

2727	Circ. Water System - Plan - Basement	5
2728	Circ. Water System - Long. Elev. - Looking East	0
2729	Circ. Water System - Elevs. Looking North	0
2730	Circ. Water System - Misc. Elevations & Details	0
2732	Lube Oil System - Flow Diagram	15
2733	Lube Oil System - Plans and Details	10
2734	Lube Oil System - Elevations and Details	0
2735	Lube Oil System - Arrangement of Pump Room Plans and Sections	0
2736	Lube Oil System - Hydraulic Coupling Arrangement Piping	0
2738	Service Air Piping - Plans and Sections	0
2739	Service Air Piping - Elevations and Details	0
2741	Fire Protection-Fog Nozzles @ Transformers and Regulators	0
2742	Fire Protection-Fog Nozzles @ Transformers and Regulators	0
2744	Equipment Drain Piping	0
2745	Equipment Drain Piping	0
2747	Hangers and Supports	0
2748	Hangers and Supports	0

Item 56 - Air Drying and Refrigeration

6 drawings scheduled.

Item 57 - Thermal Insulation (2nd Step) Nos. 37 and 38

2 drawings - Sepia tracings of drawings used in Item 54.

Item 67 - Exhauster and Compressor Control Panels

3 drawings scheduled.

Item 68 - Pressure Gages, Thermometers and Test Wells

2 drawings scheduled - May be combined with Item 68A.

Item 68A. - Control and Instrumentation Piping

10 drawings scheduled.

Item 76 - Primary Electrical Work - Substation Area

CE-102379 (3601)	Substation "G" Lighting, Grounding and Conduit Details	0
CE-102380 (3602)	Substation "B" Grounding and Conduit Details	0
CE-102381 (3604)	Substation "A", "B", "G", and Dispatch Office - Control and Alarm Wiring Diagram - Sheet 1	0
CE-102382 (3605)	Substation "A", "B", "G", and Dispatch Office - Control and Alarm Wiring Diagram - Sheet 2	0

Item 77 - Intercommunication System

3740	System Line Diagram and Feeder Conduits	0
3741	Conduit and Cable Layout and Details - Shop and Access Building No. 2 Area	0
3742	Conduit and Cable Layout and Details - Circulating Water Pump House Area	0
3743	Conduit and Cable Layout and Details-Air and Gas Piping Area	0
3744	Conduit and Cable Layout and Details - Equipment Building Area	0

Item 78 - Installation Contract - Mechanical & Electrical Equipt.

Reference drawings in Equipment Building may be used as Contract Drawings.

SUMMARY OF DRAWINGS (Approximate)	No. of Dwg.	Completion
1. Drawings under Contract - Completed	147	147
2. Drawings completed ready for contract	71	71
3. Drawings being prepared for Contract(71% comp.)	65	46
4. Drawings estimated for completion of project on which little work has been done (5% comp.)	82	4
Total Drawings	365	268
% Completion -	73%	

P L files

B 1872

WInton 1-6620
xxxxxxx
Teletype-CT520

June 27, 1950

Burns and Roe, Inc.,
233 Broadway,
New York 7, New York.

Attention: Mr. D. R. McConathy.

Subject: Contract NAw-5652 - Project No. 794 - Progress Reports No. 37 and 38.

Gentlemen:

The information you have requested in your letters of June 7th and 9th, 1950 is as follows:

Item 1 (25,000 KVA Power Transformers)

These drawings are promised to be completed by July 7, 1950.

Item 3 (Exhauster System With Motors)

The oil piping drawings for the left-hand exhausters are promised to be completed by June 30, 1950.

Item 4 (Compressor System With Motors)

We have recontacted the local Elliott office on the tabulation of the auxiliaries and the horsepower requirements. They are again expediting it with their factory.

Items3 and 4 (Compressor and Exhauster Motors)

Concrete motor support drawings along with the Burns and Roe sketch were sent to Elliott. Suspending the coolers from "T" slots in the ceilings was decided upon in a conference between Elliott and NACA in place of floor supports, horizontal angle iron bars or supports from the duct work.

Item 11 (Pressure Control Stations)

Wiring diagrams are promised by June 23, 1950 and the panel drawings by June 30, 1950.

B 1872

Item 18 (Shop and Access Building)

The control cubicle outline and wiring diagrams are being revised by the contractor. CO_2 Specifications have been sent to Burns and Roe June 15, 1950.

Item 23 (Switchgear and Transformer - C. W. Pump House)

This information has been sent to Burns and Roe.

Item 27 (Variable Frequency Starting and Exciting Equipment)

These drawings are to be finished by August 15, 1950.

Item 30 (Circulating Water Piping System)

The information requested is being supplied as it becomes available to the Contractor.

Item 37 (Thrust Platform and Thrust Transmitting Device)

Shop drawings were sent to Burns and Roe on June 6, 1950. These drawings have since been approved and returned to NACA by Burns and Roe.

Item 39 (Control and Instrumentation Piping - 1st Step)

This was discussed at the June 14th to June 16th, 1950 conference at NACA.

Item 42 (Fuel Metering Equipment)

Specifications on this equipment were sent to Burns and Roe June 22, 1950.

Item 50A (Fire Protection - Second Step)

These specifications were sent to Burns and Roe June 15, 1950.

Item 53 (Primary Electrical Work - Equipment Building Area)

Drawings on NAW-5872 are to be completed by July 1, 1950.

Item 56A (Expander Turbine)

The necessary information on this was given verbally to representatives of Burns and Roe during the conference of June 14th to June 16th, 1950 at Cleveland.

B 1872

Items 58 and 59 (Compressor and Exhaust System - Controls)

Information as to bleeder piping, size was determined in conference of June 14th to June 16th, 1950 and given verbally to representatives of Burns and Roe.

Item 61 (Butterfly Valves - Exhauster and Compressor Systems)

This contract was awarded to Henry Pratt on June 8, 1950.

Item 65 (Lube Oil System)

Roots-Connersville will complete left-hand exhauster oil piping diagrams by June 30, 1950. Local Elliott office is expediting oil system drawings on compressor.

Item 72 (Swgr. Control Equipment, Trans, & Aux. - Comp. & Exh Motors)

This information was sent to Burns and Roe in our letter of June 23, 1950.

Yours very truly,

[illegible]

Representative of the Contracting Officer

*In triplicate

cc: Burns and Roe Resident Engineer

WES:pl
EDW
CGF

cc: C&CA Files
PSL Files
C. A. Herrmann
W. L. Wilson
PSL Advance

P S & Advance
(Rep)

WInton 1-6620
xxxxxxx
Teletype-CT520

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