PROGRESS REPORT NO. 28

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

January 10, 1950

cc: NACA-4
EJT -1

RCR
RFC
KAR
WLG-2
RRB
FN
JBM
PJM
AAV-4
KBH-3
LHR-3
KWB-3
WGC-3
RDK-3
AFS
DRM
FILES

I - OPERATIONS BUILDING

a) Proposed Change Order No. 11 covering revisions to building necessitated by change in end rooms and in adding toilet and paneling as required by NACA, and sepias of new and revised drawings have been sent to NACA.

b) In general the checking of shop drawings is progressing satisfactorily, however, resubmission of shop drawings for front entrance doors is long overdue.

II - ALTITUDE TEST CHAMBERS

a) Shop drawings from Treadwell Construction Company are being processed at a steady rate.

b) Awaiting comments on drawings and rough draft of specification for thrust platform and measuring device which were sent to NACA for final approval.

III - SHOP AND ACCESS BUILDING

a) Change Order No. 7 covering changes in lighting and power circuiting and revised sepia tracings forwarded NACA. Additional changes will be required on these drawings due to relocation of the air piping outside the building.

b) Architectural and structural drawings are being revised to accommodate change in location of combustion air pipe.

IV - AIR AND GAS PIPING (1st Step) (CE-104500 to CE-104557)

a) Mechanical (CE-104500 to CE-104524)

25558

1. NACA authorized rearrangement of combustion air orifice run, and changes in drawings are now being made. Spec in preparation ready, awaiting dwgs.

2. Specifications for expansion joints for combustion air piping will be revised and sent to NACA.

3. NACA have issued to vendors, specifications for orifice fittings and butterfly valves. Bids due 1-25-50.

4. Bids received for gate valves and Burns and Roe recommendations sent to NACA for purchase. Recommended. Bids open 1-27-50.

5. Require information from NACA on all combustion air control valves Specification C-768. 48" valve will be sent from Pratt to B&R before 1-26-50.

		No. 27	No. 28
CE-104500 (2303)	Flow Diagrams - Air & Gas Piping Steel 1 and 2	92	92
CE-104501 (2301)	Gen. Arrangement - Plan Step 1 & 2	72	75
CE-104502 (2302)	Gen. Arr't. - Elev Step 1 and 2	68	70
CE-104503 (2310)	Combustion Air Piping - Plan, Elev. and Details - Altitude Test Chamber Area - First Step (Revised drawing)	93	15
CE-104506 (2313)	Combustion Air Piping - Supports Anchors and Misc. Details - 1st (Revised drawing)	90	0
CE-104507 (2314)	Exp. Joint List - Air & Gas Piping	42	42
CE-104508 (2315)	Valve List - Air & Gas Piping	28	28
CE-104509 (2316)	Control Piping, Plans, Elev. & Details, Step 1 and 2	0	0
CE-104510 (2317)	Control Piping, Sections and Details Step 1 and 2	0	0
CE-104511 (2318)	Combustion Air Piping - Arrangement of Control Valves - First Step	0	0
CE-104512 (2319)	Combustion Air Piping - Details of Supports at Control Valves	0	0

b) Exhaust Gas Ducts (CE-104525 to CE-104539)

1. Expansion joint contract awarded to Zallea Brothers by NACA. Need outline drawings of same to complete drawings of duct work.

2. Drawings CE-104527, CE-104528 and CE-104529 to be revised for combustion air by-pass connection, when this information is determined. Alcoa reviewing this quotation. Will be connection down pending Alcoa's recommendation.

3. Information needed on Exhaust control valves to determine supports and connection to gas ducts. Foundation requirements to be sent by Pratt to B&R before 1-26-50.

4. Exhaust Gas Duct contract awarded to R. L. Carter Company by NACA. (Drawings CE-104527, CE-104528, CE-104529).

5. Contract for exhaust stack, pump house, tank foundations, pipe supports, etc. was issued to bidders. (Drawings CE-104525 and CE-104526 from this group plus others).

c) Structural Steel and Concrete Design (CE-104540 to CE-104549)

1. Require information on control valves for support design.

2. Final location of by-pass will establish minor changes to foundation drawings.

3. Decision required as to requirements for walkways to secondary coolers, control valves and explosion discs on Exhast Gas Ducts.

4. Contract for Exhaust Stack, Pump Houses, Tank Foundations, Pipe Supports, etc. was issued to bidders. (Drawings CE-104543, CE-104544, and CE-104545 from this group plus others).

5. Relocation of combustion air pipe from within the Shop and Access Building to without, may require an additional foundation drawing and alterations to stairways to walkways over primary coolers and test chambers.

6. Final location of connecting pipe to air heaters may necessitate minor changes to drawing CE-104543.

		No. 27	No. 28
CE-104540 (4310)	Walkways and Stairways - Test Chamber and Primary Coolers, Elevations and Sections	80%	95%
CE-104541 (4311)	Walkways and Stairways - Test Chamber and Primary Coolers - Sections and Details	80	95

d) Electrical (CE-104550 to CE-104557)

*CE-104550 (3301)	Outdoor Area Lighting and Receptacles Plans and Details	97	98
*CE-104551 (3302)	Grounding System - Plans & Details	97	97
CE-104552 (3303)	Instrumentation and Controls - Plans and Details	0	0

*These drawings will require revisions due to relocation of air piping outside the Shop and Access Building.

V - COOLING TOWER & CIRCULATING WATER SYSTEM (CE-104558 to CE-104609)

a) Mechanical (CE-104558 to CE-104574)

1. Changes required in 18" secondary cooler lines to clear new location of high pressure fuel pump house completed. Lines to new explosion heads run. Remote operated butterfly valves for water cooled bulkhead and mono-rail added to piping drawing.

2. Drawing CE-104563 has been rechecked. Other drawings to checker on January 6, 1950.

3. Relocation of 48" Combustion Air Line may require changes to drawings due to interferences with relocated transformers.

4. Approval prints will be forwarded to NACA next week while drawings are being checked.

		No. 27	No. 28
CE-104558 (2401)	Flow Sheet and Valve List	95%	95
CE-104559 (2402)	Location & Arrangement Plan Pump House Area	95	95
CE-104560 (2403)	Location and Arrangement Plan Equipment Area	95	95
CE-104561 (2404)	Pump House Piping - Plan, Sections and Details	95	95
CE-104562 (2405)	Details of Piping at Primary and Secondary Coolers	95	95
CE-104563 (2406)	Details of Piping At Altitude Chamber	95	95
CE-104570 (2407)	Heating, Ventilating & Details	100	100
CE-104572 (2408)	Water Treatment	0	0
CE-104573 (2409)	Water Treatment	0	0

b) Structural Steel and Concrete (CE-104575 to CE-104594)

1. Contract for Exhaust Stack, Pump Houses, Tank Foundations, Pipe Supports, etc. was issued to bidders (Drawings CE-104576, CE-104577, CE-104579, CE-104580 and CE-104581 in this group plus others).

2. Removable ladders in pump house were chenged to removable stairs as requested by NACA and elevation of house drain was raised.

3. Work has been started on new drawing CE-104584. This drawing will become a part of contract for Circulating Water Piping.

4. Information is needed as to requirements for water treating building.

		No. 27	No. 28
CE-104583 (4406)	Circulating Water Pipe Supports and Manholes	95	95
CE-104584 (4408)	Steam Trench Extension Along Walcott and Westover Roads	-	5
(4409)	Water Treating Building	0	0
(4410)	Water Treating Building	0	0

c) Electrical (CE-104594 to CE-104609)

The manual-automatic control scheme for the Circulating Water Distribution System and Drawing SK-1218-E-13, "Control Diagram for Manual-Automatic Operation" are being revised in accordance with the discussion with NACA. The revised system and drawing will be sent to NACA this week. Bill of Material is being included on this drawing to cover additions and revisions for Specification No. C-1175.

			No. 27	No. 28
CE-104594 (Gen. Bldg. Cont.)	(3401)	Circ. Water Pump House Lighting Grounding and Concealed Conduit Plan	100	100
CE-104594	(3402)	Circulating Water Pump House - One Line Diagram - Switchgear and Transformer - Arrangement Plan	90	90
CE-104596	(3403)	Circulating Water Pump House - Equipment Grounding - Conduit Plan and Details	70	70
CE-104597	(3404)	Cooling Tower - Lighting Plan and Details	100	100
CE-104598	(3405)	Cooling Tower - Conduit and Grounding Plan and Details	100	100
CE-104599	(3406)	Power Ducts and Manhole Details	95	97
CE-104600	(3407)	Substation "G" Arrangement Plan and Details	100	100

VI - FUEL STORAGE AND DISTRIBUTION SYSTEM (CE-104610 to CE-104669)

a) Mechanical (CE-104610 to CE-104639)

1. NACA comments of conference December 13-14, 1949 and later comments by Mr. H. T. Lehr (Conference December 19-21, 1949) have been incorporated on drawings. Valve list is being made up with coded valve numbers.

2. Metering flow sheet will be forwarded to NACA on January 6, 1950 for comments. Metering piping is being studied to determine space requirements. This will affect final size of h.p. pump house and piping dimensions.

3. Fuel piping at Shop and Access Building awaits final location of major equipment affected by change of 48" combustion air line.

4. Chamber drain system has been re-studied and forwarded to NACA on January 5, 1950 for comments. Drawing CE-104615 requires changes to conform with outside location of drain tanks requested by NACA.

			No. 27	No. 28
CE-104610	(2501)	Flow Sheet HP and LP Systems	75	75
CE-104611	(2502)	Location and Arrangement Plan Storage & LP PH Area	95	95
CE-104612	(2503)	Location & Arrangement Plan Altitude Chamber & HP PH Area	95	95
CE-104613	(2504)	Details of Piping in LP PH	95	95
CE-104614	(2505)	Details of Piping in HP PH	80	80
CE-104615	(2506)	Details of Piping at Altitude Chamber and Valve List	50	60
CE-104619	(2510)	LP PH - Heating, Vent. & Details	100	100
*CE-104620	(2511)	HP PH - Heating, Vent. & Details	0	0
CE-104622	(2513)	Fire Protection System (CO_2)	0	0
	(2514)	Fire Protection System (CO_2)	0	0

(b) Structural Steel and Concrete (CE-104640 to CE-104654)

1. High pressure pump house will be designed when metering space requirements are determined.

2. Contract for Exhaust Stack, Pump Houses, Tank Foundations, Pipe Supports, Etc. was issued to bidders. (Drawing CE-104640, CE-104641 and CE-104642 in this group plus others).

	No. 27	No. 28
(4504) HP PH - Plan Sections & Details	15	15

(c) Electrical - (CE-104655)

Revised specifications have been prepared in rough draft form for the HP Fuel Pump House transformer and control center. Relocation of air piping will determine the location of this transformer. When final location of the transformer is established specifications will be released.

Additional controls and interlocks will require revisions to the drawings associated with the General Building contract.

		No. 27	No. 28
CE-104655 (3501)	LP Fuel Pump House - Lighting, Grounding & Concealed Conduit Plan	100%	100%
CE-104658 (3504)	HP Fuel Pump House - Lighting, Grounding and Concealed Conduit Plan	65(aa)	65(aa)

General Electrical Contract:

CE-104656 (3502)	LP Fuel Pump House - Equipment Grounding, Conduit Plan & Details	60	70
CE-104657 (3503)	Fuel Storage Area- Outdoor Lighting and Conduit Plan	100	100
CE-104659 (3505)	HP Fuel Pump House - Equipment Grounding, Conduit Plans And Details	35(aa)	35(aa)
CE-104660 (3506)	Telephone and Intercommunication Ducts and Manhole Details	0	0

(aa) Work discontinued until final building design is approved.

VII - ELECTRICAL SUBSTATIONS

NACA has assigned the following drawing #CE-102374 to CE-102384 and CE-102388 to CE-102407. It is understood that certain rearrangement and relocations of equipment are being made by NACA at Substations "B" and "G". Definite drawing number assignments and drawing titles will be allocated when these changes have been made. Both electrical and structural drawings will be required.

VIII - EQUIPMENT BUILDING

(a) Mechanical:

1. Specifications for air heaters have been released to Vendors. More specific data on heaters will permit continuation of work such as air piping and foundations in the area between the heater pit and Equipment Building.

2. Requirements for the drying and refrigeration system have been decided by NACA. Briefly these are 225# of air per second dried to 7 grain moisture content and 100#/sec. at -70°F. Tests are continuing on the air turbine. It has been suggested that a discussion on this subject be held, that the resulting conclusions be submitted to Manufacturers for study, that conferences be held with the manufacturers as to their suggested offerings before specifications are written for the procurement of equipment.

3. Certified prints of compressors, received from Elliott 12-12-49, and returned to NACA with comments.

4. Certified prints of General Arrangement of First Stage Exhausters received from Roots Connersville 12-27-49. Need certified prints for Second Stage Exhausters.

5. Need final outline drawings for intercoolers and aftercoolers from Griscom Russell and Ross Heater.

6. NACA to furnish Burns and Roe information obtained from Vendors on check valves for exhausters and compressors.

7. Data on rubber expansion joints received from U.S. Rubber Co. and sent to NACA for comments.

8. Information on low pressure butterfly valves for exhausters have been sent to vendors for recommendations, so that final specifications may be written.

9. Study drawings of arrangement of exhausters, compressors and coolers are being made, so that discussion of foundations, piping, connections, thrusts, etc. made be had with Roots Connersville, Elliott Griscom Russell and Ross Heater, at a conference in Cleveland the week of January 9, 1950.

10. The approximate final location of major equipment in the Equipment Building will permit study of cooling water system provided equipment drawing for the inter-and-after coolers can be obtained.

b) Structural and Architectural:

1. Elevation drawings are being restudied basing ultimate exterior expression on results of restudy of floor plan. Floor plan is being coordinated to ideas presented and discussed at meeting in New York on November 28, 1949.

2. Detailed design of equipment building is being delayed until more definite information is known about mechanical and electrical requirements.

3. Final drawings are being started on foundations for compressors and first stage exhausters.

4. Investigation of sound levels and sound absorption qualities for various types of construction are being made.

(c) Electrical:

1. Preliminary one line diagram is in progress, additional auxiliary motors are being added as shop drawings are received.

2. Final dimensions are required for the M-G set exciters, slip regulator, neutral resistor, starting motor-generator set. NACA to expedite.

3. Switchgear layout being held up pending final present and future 13.8 KV switchgear requirements. NACA preparing specification for same.

Progress	No. 26	No. 28
1. Operations Building	99%	99%
Amendment #1	99%	99%
Amendment #2	25	100
2. Altitude Test Chambers	98	98
3. Shop and Access Building	96	97
4. Test Air Piping	86	88
5. Cooling Tower and Circulating Water System	85	90
6. Fuel Storage and Distribution System	75	85
7. Electrical Substations	15	15
8. Equipment Building	15	18

DRMcJonathy/LHR/RDK/KBH/WGC/id

D.R. McConathy/jd

PSL Chrome

RESTRICTED

January 20, 1950

Teletype-CV520

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

Attention: Mr. W. L. Glenning.

Subject: Contract NAw-5652 - Architect-Engineer Services for Propulsion Sciences Laboratory, Phase I, Part II, Project No. 794 - Progress Report No. 28.

Gentlemen:

As suggested in your letter of January 12, 1950 many of the items on which information was needed from the NACA were discussed with your Messrs. Hoffman and Kircher last week. To avoid any misunderstanding, however, the following comments are presented on the status of the items underlined in the copy of your Progress Report No. 28 which was transmitted with this letter:

I(b) - These shop drawings are being followed up on by our construction staff. We do not believe that this particular item, however, is interfering in any way with your design work.

II(a) - All drawings have been received from the Treadwell Construction Company, with the exception of an erection drawing. Again we feel sure that this item does not effect your design progress.

II(b) - In our opinion these specifications and drawings can be made ready for release without returning them to you. We have sent them to the Toledo Scale Company for their comments, and we do not anticipate that any major changes will be required. We expect that this will be out for bids by the end of January.

IV(a)5 - The Henry Pratt Company has informed us that they are sending dimension drawings on the combustion-air valve to you on January 20, 1950.

IV(b)1 - The expansion joint drawings have already been sent to you.

RESTRICTED

IV(b)2 - The final design of the by-pass connection has not yet been established, and it will be necessary for you to write your specifications in such a manner that a change from the presently specified size can be made. This by-pass connection is a very small part of the work required and should not result in any delays.

IV(b)3 - We have received drawings of the exhaust control valve from the Henry Pratt Company and will send them to you on January 20, 1950. The Henry Pratt Company has promised to send you further details on the foundation requirements on the same day.

IV(c)1 - Previous comments apply to this item.

IV(c)3 - Information relative to valve size and explosion discs was given to your Mr. Kircher last week.

VI(b)1 - The present metering provisions which have been made are satisfactory, and we suggest that you proceed accordingly.

VI(c) - The final location of the transformer was established during our conference last week. In our estimation there is no reason to hold up the building design at this time.

VII - All rearrangement and relocation of equipment at Substations "B" and "C" were discussed with your Mr. Haffman last week, and it is our opinion that he has all the information he needs for this design.

VIII(a)1 - The bids for this equipment were opened on January 18, 1950. A copy of these bids was sent to you on the same day. We believe that the award will be made by the 24th of January.

VIII(a)4 - Mr. Kircher received drawings for use in this design. These drawings should be adequate for the present. Roots Connersville has stated that they will furnish certified drawings in about two weeks.

VIII(a)5 - Preliminary drawings were obtained last week, with final drawings to be submitted within ten days.

VIII(a)6 - Information on check valves for the exhausters and compressors will be sent to you on January 24, 1950.

VIII(a)10 - The comments for item VIII(a)5 apply.

VIII(b)2 - We believe that the intermittent point which may have existed with regard to electrical and mechanical requirements was

cleared up last week.

VIII(e)2 - Mr. Hoffman received preliminary dimensions from the Elliott Company during our conferences last week. We are following up to obtain final drawings as soon as possible.

VIII(e)3 - Our estimate concerning 13.8 KV switchgear requirements was given to Mr. Hoffman last week. NACA is preparing specifications for switchgear, and it is expected that they will be out for bids by the end of January.

We wish to point out that a major stumbling block in some of the work at this time is the water treatment. At conferences very early in December the work to be done was outlined, and it is understood that Burns and Roe is pursuing this work with maximum energy. We have let the contract for the circulating water pump house conditionally, pending a decision on this matter which can be arrived at only from Burns and Roe's studies of the water treating situation. As soon as this matter is settled, it should be possible to proceed also with the installation of equipment in the Substation "C" area. We feel that the specifications for the installation at Substation "C" can also be prepared at this time.

We believe that there has been some confusion as to the interlocking and controls required for the fuel system. We suggest that you proceed with the electrical installation without covering these items, inasmuch as they can be installed at any time after the main electrical installation has been completed.

Yours very truly,

EWW:br

Representative of the Contracting Officer.

cc: Mr. McConathy
Mr. Tempest

C&CA Files
PSL Files
Mr. Herrmann
C&CA Advance
PSL Advance

February 14, 1950 A94545

Teletype-CV520

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

Attention: Mr. D. R. McConathy.

Subject: Contract NAw-5652 - Architect-Engineer Services for Propulsion Sciences Laboratory, Phase I, Part II, Project No. 794 - Information and Drawings Required from NACA.

Gentlemen:

This will reply to your letter of February 6, 1950 and the items underlined in your Progress Report No. 39 of January 25, 1950.

I - Operations Building

Shop drawings covering lighting rearrangement for first and second floors were mailed to your attention by Hatfield Electric Company January 26, 1950.

II - Altitude Test Chambers

On the thrust platform and measuring device which was sent to us for final approval, our engineers will write you either February 13 or 14, 1950. On the control for the hatch cover operating motors, these drawings, (1) Control Cubicle Outline, (2) Control Cubicle Floor Slot Openings, and (3) Wiring Diagram for the Control, will not be furnished under the Altitude Test Chamber contract but will be furnished through the Sam W. Emerson Company as part of the drawings on the Operations Building. These drawings were furnished by Hatfield Electric Company to the Sam W. Emerson Company the end of last week and should be in your hands no later than February 17, 1950.

III - Shop and Access Building

The shop drawings from the Sam W. Emerson Company for the two 150 KVA transformers were given to your representative, Mr. Hoffman, when he was here last week.

IV - Air and Gas Piping

(a) To complete the combustion-air piping, you have requested three sets of drawings on which the situation is as follows:

48-inch orifice fitting drawings, covered by our contract with Daniel Orifice Fitting Company, NAS-1103, will be furnished you on or before March 6, 1950.
48-inch gate valve drawings on our contract with Chapman Valve Company, NAS-1096, will be furnished you on or before March 2, 1950.
On the 48-inch, 24-inch, and 12-inch control valve drawings, we will be unable to furnish these until a contract is placed covering specification No. C-768. As we advised you in our bimonthly report, award of these controls was recommended to Washington Headquarters January 6, 1950, but it was necessary for us to furnish a cost breakdown on both the Henry Pratt valves and Askania controls. This breakdown has been evaluated and referred to our Procurement Division for transmission to Headquarters.

(b) Exhaust Gas Ducts - On Zallea Brothers quoting on adding T stiffener rings to spool of expansion joints and Robert Carter to deduct for the same, both companies have advised us that they expect to have necessary information by February 14, 1950, so we should have a final decision on this by February 17, 1950. On exhaust system control valves, Henry Pratt drawing No. 3053 was mailed to your attention on February 1, 1950. You no doubt have received copies of Henry Pratt letter of February 1, 1950 requesting you to furnish them necessary dimensions for locating the footings.

(c) Structural Steel and Concrete Design - Final drawings on control valves for support design cannot be furnished until we are able to place a contract covering specification No. C-768.

IV - Cooling Tower and Circulating Water System

(c) Electrical - Regarding the switchgear arrangement proposed by Westinghouse for our specification No. C-1175, Contract NAS-1056, Westinghouse proceeded to revise their drawings when your Mr. Hoffman and our Mr. Haas called at their Cleveland plant on February 8, 1950. The revision, which is covered by four drawings, has been completed and Westinghouse advises us that they are mailing three sets to your attention today.

VIII - Equipment Building

Roots-Connersville are not ready to submit prints for the second-stage exhausters, as these have been delayed pending receipt of brake mounting information from the American Blower Company, Detroit. We contacted the American Blower Company last week and were advised that the brake matter would be settled no later than February 10, 1950, at which time they would give the information to Roots-Connersville. We have also contacted Roots-Connersville, and they will wire us if this information is not received February 13 or 14, 1950.

(b) Structural and Architectural - Regarding the letter recommending basic dimensions and grades on which you are awaiting comments so that final design of the building may be started, please see our letter of February 1, 1950.

Substructure and Equipment Foundations - You have not received shop drawings for the starting M-G exciter promised by the Elliott Company, on which you understood design and shop drawings were ready, due to the fact that this equipment, being separately excited, necessitated some design. Elliott promises three sets of drawings will be sent to you between February 15 and 22, 1950. You are also waiting for Elliott to furnish maximum outline dimensions for the slip regulator. To date they have received this information from only one manufacturer and have contacted three others. As this item is not standard, each of the three has a certain amount of design work to do. Elliott is pushing this and have promised to advise us promptly as soon as the information is received.

Yours very truly,

CGF:br
EDW

Representative of the Contracting Officer.

*In triplicate

cc: Resident Engineer
C&CA Files
PSL Files
W. L. Wilson
C. G. Fox
C. A. Herrmann
~~C&CA Advance~~

Routed to Berg, Shaker, Nyman, Harr, Snider

25652

PROGRESS REPORT NO. 29

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

January 25, 1950

cc: NACA-4
EJT-1

RCR
RFC
KAR
WLG-2
RRB
FN
JBM
PJM
AAV-4
KBH-3
KWB-3
WGC-3
RDK-3
AFS
LHR-3
DRM
FILES

I - OPERATIONS BUILDING

All design work is complete. Checking of shop drawings is progressing satisfactorily except no shop drawings have been received from Hatfield Electric Company covering lighting rearrangement for 1st and 2nd floors.

II - ALTITUDE TEST CHAMBERS

a) Shop drawings from Treadwell Construction Company are being processed.

b) Awaiting comments on drawings for thrust platform and measuring device which were sent to NACA for final approval. We understand that specification will be issued by NACA without return to Burns and Roe.

c) Proposed Change Order will be prepared to provide connections for fuel lines to Test Section and possibly to alter flow of cooling water through diffuser section (See Burns and Roe letter of 1-20-50).

d) No shop drawings have been received for the control for the hatch cover operating motors. These drawings should show: (1) Control cubicle outline, (2) Control cubicle floor slot openings, and, (3) Wiring diagram for the control.

III - SHOP AND ACCESS BUILDING

a) Shop drawings are being processed.

b) Proposed Change Order will be prepared to cover rerouting of combustion air line. Present status as follows:

1. Architectural drawing changes have been completed.

2. Structural changes to building have been completed.

3. Structural changes to pipe support foundations have been subject to final mechanical arrangement.

4. Platform over combustion air line to support transformers is being designed.

c) Fire protection system for Shop and Access Building is being studied by the Cardox Corporation. It is anticipated that tank will be supported over combustion air line on north side of building.

d) Require shop drawings from the Sam W. Emerson Company for 2-150 KVA transformers (light and power) in order to locate anchor bolts and floor slab openings in the platform over the Test Air Piping.

IV - AIR AND GAS PIPING (1st Step) (CE-104500 to CE-104557)

a) Mechanical (CE-104500 to CE-104524)

1. Changes being made to drawings CE-104503, CE-104506 and CE-104507 due to authorized change in location of orifice run. Revised drawings will be ready about February 15, 1950.

2. Revised specifications are being written for combustion air piping and expansion joints and will be ready about February 15th.

3. To complete the combustion air piping, Burns and Roe need the following information. (Will not hold up release of piping drawings).

48" orifice fitting drawings
48" gate valve drawings
48" - 24" and 12" control valve drawings

		No. 28	No. 29
CE-104500	(2303) Flow Diagrams - Air & Gas Piping Steel 1 and 2	92%	92%
CE-104501	(2301) Gen. Arrangement - Plan Step 1 & 2	75	76
CE-104502	(2302) Gen. Arr't. Elev. Step 1 and 2	70	71
CE-104503	(2310) Combustion Air Piping - Plan, Elev. and Details - Altitude Test Chamber Area - First Step (Revised drawing)	15	75
CE-104506	(2313) Combustion Air Piping - Supports Anchors and Misc. Details - 1st (Revised drawing)	0	25

			No. 28	No. 29.
CE-104507	(2314)	Exp. Joint List - Air & Gas Piping	42%	45%
CE-104508	(2315)	Valve List - Air & Gas Piping	28	28
CE-104509	(2316)	Control Piping, Plans, Elev. & Details, Step 1 and 2	0	0
CE-104510	(2317)	Control Piping, Sections and Details - Step 1 and 2	0	0
CE-104511	(2318)	Combustion Air Piping - Arrangement of Control Valves - First Step	0	0
CE-104512	(2319)	Combustion Air Piping - Details of Supports at Control Valves	0	0

b) Exhaust Gas Ducts (CE-104525 to CE-104539)

1. NACA requested Zallea Brothers to quote on adding T stiffener rings to spool of expandion joints and R.L. Carter Company to deduct for same. Now await final decision on this before correcting drawings.

? 2. Location of 24" by-pass now known and will be added to duct work drawings. Askania waited to consider location further (1-18-19-50) before [illegible] tying down the end points of the line. If location is [illegible], NACA is not aware of Askania recommendations.

3. Preliminary information received on Exhaust System Control valves. Final drawings needed to adjust duct work drawings and to complete foundation drawings. H. Pratt were supposed to send foundation requirements to B&R by the 25 or 26 of Jan. B&R probably has them now. B&R has F&F of valve. What [illegible] required for duct work.

This is questionable.

4. Shop drawings received from R. L. Carter Company. Return being held up for expansion joint and control valve information.

5. Bids on contract for exhaust stack, pump house, tank foundations, pipe supports, etc. (Drawings CE-104525 and CE-104526 from this group plus others) Opened January 18, 1950. Awaiting award information. This has been [illegible]

c) Structural Steel and Concrete Design (CE-104540 to CE104549)

Questionable

1. Require final drawings on control valves for support design.

2. Stairways to walkways over Primary Coolers and Altitude Test Chambers being revised to suit platforms over combustion air line for transformers and Cardox unit.

3. New drawing (CE-104546) will include platforms, access, etc. to explosion discs on exhaust gas ducts and secondary coolers and to exhaust control valves as required.

4. Bids on contract for Exhaust stack, Pump Houses, Tank Foundations, Pipe Supports, etc. (Drawings CE-104543, CE-104544, and CE-104545 from this group plus others) Opened Jan. 18, 1950.

5. Final location of connecting pipe to air heaters may necessitate minor changes to drawing CE-104543.

		No. 28	No. 29
CE-104540 (4310)	Walkways and Stairways - Test Chamber and Primary Coolers, Elevations and Sections	95%	95%
CE-104541 (4311)	Walkways and Stairways - Test Chamber and Primary Coolers - Sections and Details	95	95
CE-104546 (4318)	Misc. Walkways, Platforms, Ladders, etc.	-	0

d) Electrical (CE-104550 to CE-104557)

*CE-104550 (3301)	Outdoor Area Lighting & Receptacles Plans and Details	98	98
*CE-104551 (3302)	Grounding System - Plans & Details	97	97
CE-104552 (3303)	Instrumentation and Controls - Plans and Details	0	0

* These drawings are being revised to show the relocation of air piping outside the Shop and Access Building. The drawings will be included in the General Electric Contract (1st Step).

V - COOLING TOWER & CIRCULATING WATER SYSTEM (CE-104558 to CE-104609)

a) Mechanical (CE-104558 to CE-104574)

1. Drawings are being checked, corrected, and back-checked Estimate completion and forwarding of sepai tracings to NACA February 3, 1950.

2. Suggested revision to diffuser piping sent to NACA January 20, 1950 for review and comments.

3. Necessary changes to final draft specification now at NACA will be forwarded prior to Sepia tracings.

4. Water requirements for the Equipment Building will be retabulated when complete information is available. Some quantities have exceed first estimates.

		No. 28	No. 29
CE-104558 (2401)	Flow Sheet and Valve List	95%	95%
CE-104559 (2402)	Location & Arrangement Plan Pump House Area	95	95
CE-104560 (2403)	Location and Arrangement Plan Equipment Area	95	95
CE-104561 (2404)	Pump House Piping - Plan, Sections and Details	95	95
CE-104562 (2405)	Details of Piping at Primary and Secondary Coolers	95	95
CE-104563 (2406)	Details of Piping at Altitude Cham.	95	95
CE-104570 (2407)	Heating, Vent. & Details	100	100
CE-104572 (2408)	Water Treatment	0	0
CE-104573 (2409)	Water Treatment	0	0

b) Structural Steel and Concrete (CE-104575 to CE-104594)

Bids on contract for exhaust stack, pump houses, tank foundations, pipe supports, etc. (drawing CE-104576, CE-104577, CE-104579, CE-104580 and CE-104581 in this group plus others). Opened 1-18-50.

		No. 28	No. 29
CE-104583 (4406)	Circ. Water Pipe Supports and Manholes	95	95
CE-104584 (4408)	Steam Trench Extension Along Walcott and Westover Roads	5	80
(4409)	Water Treating Building	0	0
(4410)	Water Treating Building	0	0

c) Electrical (CE-104594 to CE-104609)

Sepia tracing of drawing SK-1218-E-13-1 "Control Diagram for Manual-Automatic Operation" sent to NACA. This diagram covers changes and additions to be included in an Amendment to Specification No. C-1175.

			No. 28	No. 29
CE-104594 (Gen. Bldg. Cont.)	(3401)	CW Pump House Lighting Grounding and Concealed Conduit Plan	100	100
*CE-104594	(3402)	Circ. Water Pump House - One Line Diagram - Switchgear and Transf. - Arrangement Plan	90	93
*CE-104596	(3403)	Circ. Water Pump House - Equipment Grounding - Conduit Plans and Details	70	75
*CE-104597	(3404)	Cooling Tower - Lighting Plan and Details	100	100
*CE-104598	(3405)	Cooling Tower - Conduit and Grounding Plan and Details	100	100
*CE-104599	(3406)	Power Ducts and Manhole Details	97	98
*CE-104600	(3407)	Substation "C" Arrangement Plan and Details	100	100
*CE-104601	(3408)	One Line Diag. 1st Step Oper. Phase I -		50

*These drawings will be included in General Electric Contract.

In connection with drawing CE-104594 the switchgear arrangement proposed by Westinghouse as part of their bid proposal on the dimensional outline drawing does not conform to Burns and Roe suggested arrangement as covered in specification C-1175, drawing SK-1218-E-6-2. The Westinghouse arrangement does not consider equitable bus loading. (Note Burns and Roe did not receive copies of Westinghouse enclosures with the bid proposal and threfore could not offer definite comments on the Westinghouse proposal).

It should be noted that a study is in progress to accomodate an estimated additional load of 250 hp for pumps and 50 hp for auxiliaries for water treatment. It may be possible to supply this load from the existing 500 KVA power transformers purchased on Contract NA3-1056.

This additional load may require revision and addition to this contract for the 480 volt switchgear. If the total load exceeds the transformer and switchgear capacity are additional transformer and switchgear assembly may be required.

VI - FUEL STORAGE AND DISTRIBUTION SYSTEM (CE-104610 to CE-104669)

a) Mechanical (CE-104610 to CE-104639)

1. Information received from NACA on fuel metering and selection of pumps and filters will permit design of high pressure pump house. This work is now proceeding.

2. Heating and ventilation system incorporating intake fan coils and two (2) exhaust fans as discussed with NACA by telephone on January 17, 1950 will be incorporated in pump house design.

3. Fuel piping at Altitude Chamber is being rerouted to clear transformers, electrical manhole, and new stairs and platforms relocated due to orifice run change.

4. Chamber drain system discussed with NACA January 17, 1950 and can now be placed on final drawing.

5. Low pressure fuel piping drawings, flow sheet, and valve list going to checker January 30, 1950.

6. Drawing CE-104616 "Valve List" has been added to drawing list below. This drawing is required to show valve information requested by NACA.

7. Sepia tracings of drawings designated by an asterisk (*) will be forwarded to NACA for issuance February 24, 1950, as a Low Pressure Fuel Piping Contract. High Pressure piping will be issued as soon thereafter as possible.

		No. 28	No. 29
*CE-104610 (2501)	Flow Sheet HP and LP Systems	75%	80%
*CE-104611 (2502)	Location & Arrangement Plan Storage & LP PH Area	95	95
*CE-104612 (2503)	Location & Arrangement Plan Altitude Chamber & HP PH Area	95	95
*CE-104613 (2504)	Details of Piping in LP PH	95	95
CE-104614 (2505)	Details of Piping In HP PH	80	80
CE-104615 (2506)	Details of Piping At Altitude Chamber	60	60
CE-104616 (2507)	Valve List	-	20
CE-104619 (2510)	LP PH - Heating, Vent. & Details	100	100
*CE-104620 (2511)	HP PH - Heating, Vent. & Details	0	0
CE-104622 (2513)	Fire Protection System (CO2)	0	0
(2514)	Fire Protection System (CO2)	0	0

Structural Steel and Concrete (CE-104640 to CE-104654)

1. Design of high pressure pump house will begin during week of January 23, 1950.

2. Bids on contract for exhaust stack, pump houses, tank foundations, pipe supports, etc. (Drawing CE-104640, CE-104641 and CE-104642 in this group plus others). Opened January 18, 1950.

	No. 28	No. 29
(4504) HP PH - Plan Sections and Details	15%	15%

(c) Electrical

Specification for the HP Fuel Pump House 500 KVA transformer and motor control center, and sepia tracing of drawing SK-1311 were sent to NACA on 1-24-50.

It was agreed to locate the 500 KVA transformer and the 2 - 150 KVA transformers for light and power supply for the Shop and Access Building on platform over the test air piping.

		No. 28	No. 29
CE-104655 (3501) (Gen. Bldg. Cont.)	LP Fuel Pump House - Lighting, Grounding & Concealed Conduit Plan	100%	100%
CE-104658 (3504)	HP Fuel Pump House - Lighting, Grounding and Concealed Conduit Plan	65(aa)	0(aa)

General Electrical Contract

CE-104656 (3502)	LP Fuel Pump House - Equipment Grounding, Conduit Plan & Details	70	75
CE-104657 (3503)	Fuel Storage Area - Outdoor Lighting and Conduit Plan	100	100
CE-104659 (3505)	HP Fuel Pump House - Equipment Grounding, Conduit Plans & Details	35(aa)	0(aa)
CE-104660 (3506)	Telephone and Intercommunication Ducts and Manhole Details	0	35

(aa) Final building design approved - work in progress on these drawings.

VII - ELECTRICAL SUBSTATIONS

NACA has assigned the following drawings CE-102374 to CE-102384 and CE-102388 to CE-102407. Definite drawing number assignments and drawing titles will be allocated for electrical and structural work will be included in the next Progress Report.

VIII - EQUIPMENT BUILDING

(a) Mechanical

1. Proposals for air heaters have been received from Vendors. Burns and Roe comments will be sent to NACA on January 24, 1950.

2. Requirements for the drying and refrigeration system have been decided. Preliminary discussion with tow vendors have been held. A letter will be issued shortly as a basis for vendor's preparation for Conference discussion.

3. Arrangement of compressors, exhausters, foundations and piping discussed with Elliott Company and Roots Connersville in Cleveland on January 12th and 13th.

4. Require certified prints for Second Stage Exhausters from Roots Connersville.

5. Outline drawings for intercoolers and aftercoolers from Griscom Russell and Ross Heater Company were received in Cleveland on January 10th and 11th.

6. Type of expansion joints to be used in equipment building discussed with NACA in Cleveland on January 12th. Specifications for same will be started as soon as possible.

7. Information on low pressure butterfly valves for exhausters have been received from vendors. Specifications for same will be started as soon as possible.

8. Study will be started on Central Lubrication System in Equipment Building during week of January 23, 1950.

9. Study will be started on Circulating Water System in Equipment Building.

The following list of drawings have been tentatively scheduled as necessary for the mechanical work. These drawings will later be divided into Contract groups.

B&R Dwg. #	NACA No.	Title — CE-104700 to CE-104799
2701		Operating Floor Plan
2702		Basement Floor Plan
2703		Mezzanine Floor Plans
2704		Cross Sections (2)
2705		Cross Sections (2)
2706		Longitudinal Sections (2)
2707		Longitudinal Sections (2)
2708		Exh. Ducts - Secondary Coolers to Equip. Bldg.
2709		Exh. Ducts - 1st Stage Exhauster
2710		Exh. Ducts - 1st Stage Exhauster
2711		Exh. Ducts - Second Stage Exhauster
2712		Exh. Ducts - Second Stage Exhauster
2713		Exh. Ducts - Second Stage Exhauster
2714		Exh. Ducts - Second Stage Exhauster
2715		Exhauster Bleed Piping
2716		Combustion Air Piping - Intake & 1st Stage Comp.
2717		Combustion Air Piping - 2nd Stage Compressor
2718		Combustion Air Piping - 2nd Stage to Header & Air Heaters

B&R Dwg. #	NACA NO.	Title
2719		Comb. Air Piping - Aftercoolers to Refrig. System
2720		Comb. Air Piping - Refrig. Sys. to Exp. Turbine
2721		Comb. Air Piping - Exp. Turbine to Header
2722		Comb. Air Piping - Details
2723		Gen. Arrg't Plan of Refrig & Drying System
2724		Gen. Arrg't. Elev. of Refrig. & Drying System
2725		
2726		Circulating Water Piping - Plan
2727		Circulating Water Piping - Elevations
2728		Circulating Water Piping - Elevations
2729		Circulating Water Piping - Elevations
2730		Circulating Water Piping - Details
2731		Circulating Water Piping - Details
2732		Utility Compressed Air Piping
2733		Utility Compressed Air Piping
2734		Central Lubrication System - Plans
2735		Central Lubrication System - Elevations
2736		Central Lubrication System - Sections
2737		Central Lubrication System - Details
2738		Instrument Lists
2739		Instrument Lists
2740		Instrument Piping Plan
2741		Instrument Piping Details
2742		Control Panels - First Stage Exhausters
2743		Control Panels - Second Stage Exhausters
2744		Control Panels - Compressors
2745		Control Air Piping Plan
2746		Control Air Piping Details
2747		Hydraulic Valve Oil Piping - Plan
2748		Hydraulic Valve Oil Piping - Details
2749		Intercooler Drain Piping
2750		Heating and Ventilating System
2751		Heating and Ventilating System
2752		Heating and Ventilating System
2753		Heating and Ventilating System
2754		Control Room - Air Conditioning System
2755		Control Room - Air Conditioning System
2756		Floor Openings

(b) Structural and Architectural

1. Elevation drawings are being prepared showing an exterior composed of Q-panels with horizontal run of fluted section, brick, glass block and windows in rear only. This represents present thinking but is not final.

(This drawing sent to NACA - 1-20 for approval and comments).

2. Investigation of sound absorption qualities for various types of construction are still being made.

3. Letter is being issued recommending basic dimensions and grades so that final design of building may be started.

4. Final drawings are being made of foundations for compressors and first stage exhausters.

5. A tentative drawing list for building and foundations has been made as follows:

EQUIPMENT BUILDING SUPERSTRUCTURE

Architectural

B&R Dwg. #	NACA No.	Title
		Plot Plan
		Basement Plan
		Operating Floor Plan
		Roof Plan
		Mezzanine Plan & Sections - Control Room
		Mezzanine Plan & Sections - Elec. Mez.
		Control Room Details
		North Elevation
		South Elevation
		East Elevation
		West Elevation
		Transverse Section
		Longitudinal Section
		Typical Wall & Window Details - Sheet 1
		Typical Wall & Window Details - Sheet 2
		Typical and Special Door Details
		Entrance Details
		Toilet and Locker Room Details
		Stair & Railing Details - Plans - Sheet 1
		Stair & Railing Details - Plans - Sheet 2
		Misc. & Special Details - Sheet 1
		Misc. & Special Details - Sheet 2
		Cold & Hot Water Piping - Plan
		Cold & Hot Water Piping - Section
		Sanitary & Storm Sewer Piping - Plan
		Sanitary & Storm Sewer Piping - Section
		Schedules, Windows, Doors, Hardware, Finish

Structural

		Roof Framing Plan
		Control Room Mezzanine Framing Plan
		Electrical Mezzanine Framing Plan
		Operating Floor Framing Plan

B&R Dwg. #	NACA No.	Title
		Col. Schedule & Crane Girder Details
		Col. Line Elevations - East & West Walls
		Col. Line Elevations - North & South Walls

EQUIPMENT BUILDING SUBSTRUCTURE & EQUIPMENT FOUNDATIONS

Structural

Building Foundation Plan
Basement Floor Plan
Concrete Enclosure for intake & exhaust pipes
Compressor foundation
1st Stage Exhauster Foundation
2nd Stage Exhauster Foundation
Motor Generator set Foundation
Miscellaneous Equipment Foundations
Air Heater Foundations
Transformer Foundations

c) Electrical:

Study drawings showing running switchgear arrangement, Main (13.8 KV) power and 2300 volt power transformers arrangement are in preparation and will be sent to N.A.C.A. shortly. These arrangements are based upon one-line drawings received from N.A.C.A. during Conferences 1-12 and 13-50.

No shop drawings have been received for the starting M-G exciter, although promised by Elliott for early submission. It was understood that the M-G exciter set was of Crocker-Wheeler design and shop drawings were ready.

Why not?

At the Conference 1-12-and 13-50 Elliott promised maximum outline dimensions for the slip regulator as received from various manufacturers. This information has not been received by Burns and Roe.

The following is a tentative list of electrical drawings planned for this work.

DWG.NO	TITLE
3701	Main One Line Diagram - Sheet 1
3702	Main One Line Diagram - Sheet 2
3703	Auxiliary One Line Diagram - Sheet 1
3704	Auxiliary One Line Diagram - Sheet 2
3705	Interconnection Wiring Diagram - Sheet 1
3706	Interconnection Wiring Diagram - Sheet 2
3707	Annunciator Schematic Diagram
3708	Wiring Diagram - Sheet 1
3709	Wiring Diagram - Sheet 2
3710	Wiring Diagram - Sheet 3

DWG.NO.	TITLE
3711	Wiring Diagram - Sheet 4
3712	Wiring Diagram - Sheet 5
3713	Wiring Diagram - Sheet 6
3714	Lighting Plan - Basement Floor
3715	Lighting Plan - Basement Mezzanine
3716	Lighting Details - Basement Floor & Mezzanine
3717	Lighting Plan - Operating Floor
3718	Lighting Plan - Control Room & Utility Mezzanine
3719	Lighting Details - Operating Floor & Mezzanine
3720	Arrangement Plan - Basement Mezzanine
3721	Arrangement Plan - Operating Floor
3722	Arrangement Plan - Electrical Bay - Operating Floor
3723	Arrangement Plan - Control Room
3724	Arrangement Plan - Substation "J"
3725	Elevations & Sections - Substation "J"
3726	Elevations & Sections - Electrical Bay
3727	Conduit Plan - Basement Floor - Sheet 1
3728	Conduit Plan - Basement Floor - Sheet 2
3729	Conduit Plan - Operating Floor - Sheet 1
3730	Conduit Plan - Operating Floor - Sheet 2
3731	Conduit Plan - Gas Fired Air Heaters
3732	Conduit Details - Sheet 1
3733	Conduit Details - Sheet 2
3734	Conduit Details - Sheet 3
3735	Grounding Plan and Details
3736	Underground Ductlines and Manhole Details
3737	13.8 KV Motor Leads - Details - Sheet 1
3738	13.8 KV Motor Leads - Details - Sheet 2
3739	Telephone & Signal System - Basement Floor
3740	Telephone & Signal System - Operating Floor
3741	Telephone & Signal System - Elevations & Details
3742	Telephone & Signal System - Underground Services
3743	Riser Diagrams & Schedules - Sheet 1
3744	Riser Diagrams & Schedules - Sheet 2
3745 to 3750	

DRMcConathy/LHR/RDK/WGC/id

DRMcConathy

27238

PROGRESS REPORT NO. 30

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

February 6, 1950

cc: NACA-4
EJT-1

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

I - OPERATIONS BUILDING

All design work is complete. Checking of shop drawings is progressing satisfactorily. Shop drawings have been received from Hatfield Electric Company covering lighting rearrangement for 1st and 2nd floors and are being checked.

II - ALTITUDE TEST CHAMBERS

a) Shop drawings from Treadwell Construction Company are being processed.

b) Awaiting comments on drawings for thrust platform and measuring device which were sent to NACA for final approval. NACA is preparing letter commenting on this design.

c) Proposed Change Order will be prepared to provide connections for fuel lines to Test Section and to alter flow of cooling water through diffuser section.

d) No shop drawings have been received for the control for the hatch cover operating motors. These drawings should show: (1) control cubicle outline, (2) Control cubicle floor slot openings, and, (3) Wiring diagram for the control

III - SHOP AND ACCESS BUILDING

a) Shop drawings are being processed.

b) Proposed Change order is being prepared covering effect on contract NAw-5794 of rerouting orifice run of combustion air line, rerouting portion of high pressure fuel lines and providing support for tank for CO_2 fire protection system. Present status is as follows:

1. Architectural drawing changes have been completed.

2. Structural changes to pipe support foundations have been completed.

3. Structural changes to building have been completed.

4. Platform over combustion air line on south side of building to support transformers has been completed.

5. Platform over combustion air line on north side of building to support tank for CO_2 fire protection system is being designed.

6. It is anticipated that NACA will receive this proposed change order during week of February 6, 1950.

c) Require shop drawings from the S. W. Emerson Company for 2-150 KVA transformers (light and power) in order to locate anchor bolts and floor slab openings in the platform over the Test Air Piping. We understand these drawings have been forwarded by G. E. Company. (Not received by Burns and Roe to date (2-3-50).

IV - AIR AND GAS PIPING (1st Step) (CE-104500 to CE-104557)

a) Mechanical (CE-104500 to CE-104524)

1. Changes being made to drawings CE-104503, CE-104506 due to authorized change in location of orifice run. Final approval drawings will be ready about February 6, 1950.

2. Revised specifications are being written for combustion air piping and expansion joints and will be ready about Feb. 6.

3. To complete the combustion air piping drawing details, Burns and Roe need the following information. (Will not hold up release of piping drawings for contract)

48" orifice fitting drawings
48" gate valve drawings
48" - 24" and 12" control valve drawings

		No. 29	No. 30
CE-104500 (2303)	Flow Diagrams - Air and Gas Piping Steel 1 and 2	92%	93%
CE-104501 (2301)	Gen. Arrg't. - Plan Step 1 & 2	76	7
CE-104502 (2302)	Gen. Arrg't. - Elev. Step 1 & 2	71	
CE-104503 (2310)	Combustion Air Piping - Plan, Elev. and Details - Altitude Test Chamber First Step (Revised drawing)	75	85
CE-104506 (2313)	Combustion Air Piping - Supports Anchors and Misc. Details - 1st (revised drawing)	25	75
CE-104507 (2314)	Exp. Joint List - Air & Gas Piping	45	50
CE-104508 (2315)	Valve List - Air & Gas Piping	28	30
CE-104509 (2316)	Control Piping, Plans, Elev. & Details, Step 1 and 2	0	0
CE-104510 (2317)	Control Piping, Sections and Details - Step 1 and 2	0	0
CE-104511 (2318)	Combustion Air Piping - Arrangement of Control Valves - First Step	0	0
CE-104512 (2319)	Combustion Air Piping - Details of Supports at Control Valves	0	0

b) Exhaust Gas Ducts (CE-104525 to CE-104539)

1. NACA requested Zallea Brothers to quote on adding T stiffener rings to spool of expansion joints and R. L. Carter Company to deduct for same. Now await final decision on this before correcting drawings. (See B&R letter dated Feb. 1)

2. Preliminary information received on Exhaust System Control valves. Final drawings needed to adjust duct work drawings and to complete foundation drawings.

3. Shop drawings received from R. L. Carter Company. Return being held up for expansion joint and control valve information.

4. Contract for Exhaust Stack, Pump House, Tank Foundations, Pipe Supports, etc. (drawings CE-104525 and CE-104526 from this group plus others) awarded R. Hansen Company (NAw-5851). Minor revisions were made to these drawings due to relocation of orifice run and preliminary information on control valves.

c) Structural Steel and Concrete Design (CE-104540 to CE-104549)

1. Require final drawings on control valves for support design.

2. Stairways to walkways over Primary Coolers and Altitude Test Chambers being revised to suit platforms over combustion air line for transformers and Cardox unit.

3. New drawing (CE-104546) will include platforms, access, etc. to explosion discs on exhaust gas ducts and secondary coolers and to exhaust control valves as required.

4. Contract for Exhaust Stack, Pump Houses, Tank Foundations, Pipe Supports, etc. (drawings CE-104543, CE-104544, and CE-104545 from this group plus others) awarded to R. Hansen Company (NAw-5851). Drawing CE-104543 (Trench for Air Headers) is being redrawn occasioned by rerouting of orifice run and use of hinged expansion joint on air pipes which deepened trench and eliminated pressure thrusts. New drawing is 50% complete. Proposed Change Order will be sent to NACA during week of February 6th. (NACA have suggested a further major change)

5. Final location of connecting pipe to air heaters may necessitate minor changes to drawing CE-104543.

		No. 29	No. 30
CE-104540 (4310)	Walkways and Stairways - Test Chamber and Primary Coolers, Elevations and Sections	95%	95%
CE-104541 (4311)	Walkways and Stairways - Test Chamber and Primary Coolers - Sections & Details	95	95
CE-104546 (4318)	Misc. Walkways, Platforms, Ladders, etc.	9	5

d) Electrical (CE-104550 to CE-104557)

*CE-104550 (3301)	Outdoor Area Lighting & Receptacles Plans and Details	98	100
*CE-104551 (3302)	Grounding System - Plans & Details	97	100
CE-104552 (3303)	Instrumentation and Controls - Plans and Details	0	0

* These drawings have been revised to show the relocation of air piping outside the Shop and Access Building. The drawings will be included in the General Electrical Contract (1st Step).

V - COOLING TOWER & CIRCULATING WATER SYSTEM (CE-104558 to CE-104609)

a) Mechanical (CE-104558 to CE-104609)

1. Final specification revisions forwarded January 31, 1950.

2. Diffuser piping being revised in accordance with Burns and Roe letter dated 12/20/50.

3. Sepia tracings of piping drawings will be forwarded to NACA February 14, 1950. Checking has required more time than originally contemplated due to numerous piping changes which have been required by design changes, etc.

4. Drawings indicated as 97% have been checked, and corrected and must be back-checked.

		No. 29	No. 30
CE-104558 (2401)	Flow Sheet and Valve List		
CE-104559 (2402)	Location & Arrangement Plan	95%	97%
	Pump House Area	95%	97%
CE-104560 (2403)	Location & Arrangement Plan Equipment Area	95	97
CE-104561 (2404)	Pump House Piping - Plan, Sections and Details	95	97
CE-104562 (2405)	Details of Piping at Primary and Secondary Coolers	95	97
CE-104563 (2406)	Details of Piping at Altitude Chamber	95	95
CE-104570 (2407)	Heating, Vent. & Details	100	100

b) Structural Steel and Concrete (CE-104575 5o CE-104594)

1. Contract for Exhaust Stack, Pump Houses, etc. (Drawing CE-104576, CE-104577, CE-104579, CE-104580 and CE-104581 in this group plus others) awarded R. Hansen Company (NAw-5851).

2. Minor revision showing manhole and catchbasin details being made to drawing CE-104583.

		No. 29	No. 30
CE-104583 (4406)	C. W. Pipe Supports & Manholes	95%	95%
CE-104584 (4408)	Steam Trecnh Extension Along Walcott and Westover Roads	80	95

c) Electrical (CE-104594 to CE-104609)

Sepia tracing of drawing SK-1218-E-13-1 "Control Diagram for Manual-Automatic Operation" sent to NACA. This diagram covers changes and additions to be included in an Amendment to Specification No. C-1175. NACA advised verbally that they have certain changes. This will be discussed during Conference the week of February 6, 1950.

		No. 29	No. 30
CE-104594 (3401) (Gen. Bldg. Cont.	CW Pump House Lighting Grounding & Concealed Conduit Plan	100	100
*CE-104594 (3402)	C.W. Pump House - One Line Diagram Switchgear & Transf. Arrangement Plan	93	95
*CE-104596 (3403)	C.W. Pump House - Equipment Grounding Conduit Plans and Details	75	80
*CE-104597 (3404)	Cooling Tower - Lighting Plan & Details	100	100
*CE-104598 (3405)	Cooling Tower - Conduit and Grounding Plans and Details	100	100
*CE-104599 (3406)	Power Ducts and Manhole Details	98	100
*CE-104600 (3407)	Substation "C" Arrangement Plan and Details	100	100
*CE-104601 (3408)	One Line Diagram - 1st Step Operation Phase I -	50	75

***These drawings will be included in General Electrical Contract.**

In connection with drawing CE-104594 the switchgear arrangement proposed by Westinghouse as part of their bid proposal on the dimensional outline drawing does not conform to Burns and Roe suggested arrangement as covered in specification C-1175, drawing SK-1218-E-2. Rearrangement of switchgear is in progress and will be discussed with NACA during Conference of February 6, 1950.

It should be noted that a study is in progress to accommodate an estimated additional load of 250 hp for pumps and 50 hp for auxiliaries for water treatment.

This additional load will require a new transformer and switchgear. This additional equipment will be discussed with NACA during Conference of February 6, 1950.

VI - FUEL STORAGE AND DISTRIBUTION SYSTEM (CE-104610 to CE-104669)

a) Mechanical (CE-104610 to CE-104630)

1. Drawings indicated with an asterisk (*) are ready for checking. Checking started February 1, 1950.

2. These drawings will be ready for final issue about March 1st, 1950 as a Low Pressure Fuel Piping Contract.

3. Remaining Fuel Piping drawings (High Pressure Pumphouse and Altitude Chamber) will be ready about the same time or shortly thereafter. It seems advisable to issue all drawings at the same time under a single specification which will provide a unified contract responsibility and less coordination.

4. Drawing #CE-104617 "Fuel Piping - High Pressure Pumphouse Sections" has been added to drawing list to permit sufficient detail of piping and to provide room for metering as required.

5. Draft of Fuel Piping Specification will be forwarded to NACA February 10, 1950 together with approval prints of drawings indicated with an asterisk (*).

			No. 29	No. 30
*CE-104610	(2501)	Flow Sheet HP & LP Systems	80%	85%
*CE-104611	(2502)	Location & Arrangement Plan Storage & LP PH Area	95	95
*CE-104612	(2503)	Location & Arrangement Plan Altitude Chamber & HP PH Area	95	95
*CE-104613	(2504)	Details of Piping in LP PH	95	95
CE-104614	(2505)	Fuel Piping - HP PH - Plans	80	80
CE-104615	(2506)	Details of Piping At Altitude Chamber	60	65
*CE-104616	(2507)	Valve List	20	40
CE-104617	(2508)	Fuel Piping HP PH - Sections	0	0
CE-104619	(2510)	LP PH - Heating, Vent & Details	100	100
CE-104620	(2511)	HP PH - Heating, Vent. & Details	0	10
CE-104622	(2513)	Fire Protection System (CO2)	0	0
	(2514)	Fire Protection System (CO2)	0	0

b) Structural Steel and Concrete (CE-104631 to CE-104654)

1. Preliminary sketch of high pressure pump house sent to NACA for approval. Awaiting comments before completing design. (Received February 3rd).

2. Contract for Exhaust Stack, Pump Houses, Tank Foundations, Pipe Supports, etc. (Drawing CE-104640, CE-104641 and CE-104642 in this group plus others) awarded R. Hansen Company (NAw-5851).

NACA No.	B&R No.	Title	No. 29	No. 30
	(4504)	Pump Floor and Metering Floor	-	5%
	(4505)	Elevations	-	5%
	(4506)	Typical Wall, Window, Door & Stair Details	-	5
	(4507)	Roof Plan, Plot Plan, Plumbing & Finish Schedules	-	5
	(4510)	Piling Plan, Foundations, Pump Floor & Details	-	0
	(4511)	Framing, Plans - Metering Floor, Roof, Column Schedule & Details	-	0
	(4512)	Elevations & Details	-	0

c) Electrical

Hansen Contract (NAw-5851)

CE-104655 (Gen. Bldg. Cont.)	(3501)	LP Fuel Pump House - Lighting, Grounding & Concealed Plan	100%	100%

General Electrical Contract

CE-104656	(3502)	LP Fuel Pump House - Equipment Grounding, Conduit Plan & Details	75	77
CE-104657	(3503)	Fuel Storage Area - Outdoor Lighting and Conduit Plan	100	100
CE-104660	(3506)	Telephone & Intercommunication Ducts and Manhole Details	35	75

HP Fuel Pumphouse Contract

CE-104658	(3504)	HP Fuel Pumphouse - Lighting and Details	0	0
CE-104659	(3505)	HP Fuel Pumphouse - Equipment Grounding, Conduit Plan and Details	0	0

VII - ELECTRICAL SUBSTATIONS - (CE-102374 to CE-102383)
(CE-102388 to CE-102407)

a) Electrical

3601 - Substation "A" Wiring Diagrams - Control, Relaying and Alarms
3602 - Substation "B" Arrangement Plan including Grounding and One Line Diagram
3603 - Substation "B" Elevs. and Sections - Bays 1,2,6, & 7
3604 - Substation "B" Wiring Diagrams - Control, Relaying and Alarms
3605 - Substation "G" Arrangement Plan, including Lighting and Grounding - One Line Diagram
3606 - Substation "G" Elevations and Sections (Existing and New Bays)
3607 - Substation "G" Cable (34.5KV) Routing - Cable Vault
3608 - Substation "G" Wiring Diagrams - Control, Relaying and Alarms
3609 - Substation "G" Conduit Plan
3610 - Underground Ductlines (34.5KV) and Manholes - 2nd Step Operation

b) Structural

4601 Substation "B" Reactor Foundations and Manholes
4602 Substation "G" Framing Plan and Details - New Bay

VIII - EQUIPMENT BUILDING

1. Proposals for gas fired air heaters received and comments returned 1/24/50. Awaiting award and certified prints to start design. Air piping design being delayed.

2. Requirements for the drying and refrigeration system have been decided. Preliminary discussion with two vendors have been held. A letter has been issued to York, Carrier and Magher as a basis for vendor's preparation for Conference discussion.

3. Require certified prints for Second Stage Exhausters from Roots Connersville.

4. Specifications for expansion joints for duct work and piping in Equipment Building will be started as soon as possible.

5. Information on low pressure butterfly valves for exhausters have been received from vendors. Specifications for same will be started as soon as possible.

6. Study being made on Central Lubrication System in Equipment Building.

7. Study being made of Ventilating System for Equipment Building.

8. Study will be started on Circulating Water System in Equipment Building as soon as possible.

9. Study being made for CO_2 fire protection system for Equipment Building.

The following list of drawings have been tentatively scheduled as necessary for the mechanical work. These drawings are being divided into Contract groups by the Design Department.

B&R Dwg. #	NACA No.	Title (CE-104700 to CE-104799)	No. 30
2701		Operating Floor Plan	10%
2702		Basement Floor Plan	10
2703		Mezzanine Floor Plans	0
2704		Cross Sections (2)	10
2705		Cross Sections (2)	0
2706		Longitudinal Sections (2)	5
2707		Longitudinal Sections (2)	0
2708	Note: Will be made by Structural Dept.	(Exh. Duct - Sec. Coolers to Equip. Bldg.	
2709		(Exh. Ducts - 1st Stage Exhauster	
2710		(Exh. Ducts - 1st Stage Exhauster	
2711		(Exh. Ducts - Second Stage Exhauster	
2712		(Exh. Ducts - Second Stage Exhauster	
2713		(Exh. Ducts - Second Stage Exhauster	
2714		(Exh. Ducts - Second Stage Exhauster	
2715		Exhauster Bleed Piping	
2716		Combustion Air Piping - Intake & 1st Stage Comp.	
2717		Combustion Air Piping - 2nd Stage Compressor	
2718		Combustion Air Piping - 2nd Stage to Header & Air Heaters	
2719		Comb. Air Piping - Aftercoolers to Refrigeration System	No Progress
2720		Comb. Air Piping - Refrigeration System to Expansion Turbine	"
2721		Combustion Air Piping - Expansion Turbine to Header	"
2722		Combustion Air Piping - Details	"
2723		Gen. Arrg't Plan of Refrigeration and Drying System	"
2724		Gen. Arrg't Elevation of Refrigeration and Drying System	"
2725			
2726		C. W. Piping - Plan	"
2727		C. W. Piping - Elevations	"
2728		C. W. Piping - Elevations	"
2729		C. W. Piping - Elevations	"
2730		C. W. Piping - Details	"
2731		C. W. Piping - Details	"
2732		Utility Compressed Air Piping	"
2733		Utility Compressed Air Piping	"
2734		Central Lubrication System - Plans	"
2735		Central Lubrication System - Elevations	"
2736		Central Lubrication System - Sections	"
2737		Central Lubrication System - Details	"

B&R Dwg. #	NACA No.	Title	No. 30
2738		Instrument Lists	No Progress
2739		Instrument Lists	"
2740		Instrument Piping Plan	"
2741		Instrument Piping Details	"
2742		Control Panels - First Stage Exhausters	"
2743		Control Panels - Second Stage Exhausters	"
2744		Control Panels - Compressors	"
2745		Control Air Piping Plan	"
2746		Control Air Piping Details	"
2747		Hydraulic Valve Oil Piping - Plan	"
2748		Hydraulic Valve Oil Piping - Details	"
2749		Intercooler Drain Piping	"
2750		Heating and Ventilating System	"
2751		Heating and Ventilating System	"
2752		Heating and Ventilating System	"
2753		Heating and Ventilating System	
2754		Control Room - Air Conditioning System	"
2755		Control Room - Air Conditioning System	"
2756		Floor Openings	

b) Structural and Architectural

1. Elevation drawings showing an exterior composed of Q-panels with horizontal run of fluted section, brick, glass block and windows in rear only sent to NACA. Has been discussed by telephone. Now awaiting formal comments.

2. Letter and Laboratory report on sound transmission qualities of perforated Q-Paneling sent to NACA. Awaiting comments (Letter dated January 30, 1950).

3. Design of building is progressing based on basic dimensions and grades as stated in Burns and Roe letter dated January 24, 1950.

4. Final drawings are being made of foundations for compressors and first stage exhausters.

5. A tentative drawing list for building and foundations has been made as follows:

Architectural

NACA No.	B&R No.	Title
	(4701)	Plot Plan
	(4702)	Basement Plan
	(4703)	Operating Floor Plan
	(4704)	Roof Plan

NACA No.	B&R No.	Title
	(4705)	Mezzanine Plan and Sections - Control Room
	(4706)	Mezzanine Plan and Sections - Elec. Mez.
	(4707)	Control Room Details
	(4708)	North Elevation
	(4709)	South Elevation
	(4710)	East Elevation
	(4711)	West Elevation
	(4712)	Transverse Section
	(4713)	Longitudinal Section
	(4714)	Typical Wall & Window Details - Sheet 1
	(4715)	Typical Wall & Window Details - Sheet 2
	(4716)	Typical and Special Door Details
	(4717)	Entrance Details
	(4718)	Toilet and Locker Room Details
	(4719)	Stair & Railing Details - Plans - Sheet 1
	(4720)	Stair & Railing Details - Plans - Sheet 2
	(4721)	Misc. & Special Details - Sheet 1
	(4722)	Misc. & Special Details - Sheet 2
	(4723)	Cold & Hot Water Piping - Plan
	(4724)	Cold & Hot Water Piping - Section
	(4725)	Sanitary & Storm Sewer Piping - Plan
	(4726)	Sanitary & Storm Sewer Piping - Section
	(4727)	Schedules, Windows, Doors, Hardware, Finish
		Sturctural (Superstructure)
	(4731)	Roof Framing Plan
	(4732)	Roof Truss
	(4733)	Control Room Mezzanine Framing Plan
	(4734)	Electrical Mezzanine Framing Plan
	(4735)	Operating Floor Framing Plan
	(4736)	Col. Sched. & Crane Girder Details
	(4737)	Col. Line Elevations - East & West Walls
	(4738)	Col. Line Elevations - North & South Walls
		Structural (Substructure and Foundations)
	(4746)	Building Foundation Plan
	(4747)	Basement Floor Plan
	(4748)	Concrete Enclosure for Intake & Exhaust Pipes
	(4749)	Compressor Foundation - Sheet 1
	(4750)	Compressor Foundation - Sheet 2
	(4751)	1st Stage Exhauster Foundation
	(4752)	2nd Stage Exhauster Foundation - Sheet 1
	(4753)	2nd Stage Exhauster Foundation - Sheet 2
	(4754)	Motor Generator Set Foundation
	(4755)	Misc. Equipment Foundations
	(4756)	Air Heater Foundations
	(4757)	Transformer Foundations
	(4758)	Refrig. Equipment Foundation - Sheet 1
	(4759)	Refrig. Equipment Foundation - Sheet 2

c) Electrical

Study drawings showing running switchgear arrangement, main (13.8 KV)power and 2300 volt power transformers arrangement sent NACA 1-27-50. These arrangements are based upon one-line drawings received from NACA during Conferences 1-12 and 13-50.

No shop drawings have been received for the starting M-G exciter, although promised by Elliott for early submission. It was understood that the M-G exciter set was of Croker-Wheeler design and shop drawings were ready.

At the Conference 1-12 and 13-50 Elliott promised maximum outline dimensions for the slip regulator as received from various manufacturers. This information has not been received by Burns and Roe.

Electrical drawings

NACA No.	B&R No.	Title
	3701	Main One Line Diagram - Sheet 1
	3702	Main One Line Diagram - Sheet 2
	3703	Auxiliary One Line Diagram - Sheet 1
	3704	Auxiliary One Line Diagram Sheet 2
	3705	Interconnection Wiring Diagram - Sheet 1
	3706	Interconnection Wiring Diagram - Sheet 2
	3707	Annunciator Schematic Diagram
	3708	Wiring Diagram - Sheet 1
	3709	Wiring Diagram - Sheet 2
	3710	Wiring Diagram - Sheet 3
	3711	Wiring Diagram - Sheet 4
	3712	Wiring Diagram - Sheet 5
	3713	Wiring Diagram - Sheet 6
	3714	Lighting Plan - Basement Floor
	3715	Lighting Plan - Basement Mezzanine
	3716	Lighting Details - Basement Floor & Mezzanine
	3717	Lighting Plan - Operating Floor
	3718	Lighting Plan - Control Room & Utility Mezzanine
	3719	Lighting Details - Operating Floor and Mezzanine
	3720	(See Below *)
	3721	Arrangement Plan - Basement Mezzanine
	3722	Arrangement Plan - Operating Floor
	3723	Arrangement Plan - Elec. Bay - Operating Floor
	3724	Arrangement Plan - Control Room
	3725	Arrangement Plan - Substation "J"
	3726	Elevations & Sections - Substation "J"
	3727	Elevations & Sections - Electrical Bay
	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

NACA No.	B&R No.	Title
	3734	Conduit Details - Sheet 2
	3735	Conduit Details - Sheet 3
	3736	Grounding Plan - Inc. Subs. "J" & Gas Fired Air Htrs.
	3737	(See Below**)
	3738	Underground Ductlines and Manhole Details
	3739	13.8 KV Motor Leads - Details - Sheet 1
	3740	13.8 KV Motor Leads - Details - Sheet 2
	3741	Telephone & Signal System - Basement Floor
	3742	Telephone & Signal System - Operating Floor
	3743	Telephone & Signal System - Elevations & Details
	3744	Telephone & Signal System - Underground Services
	3745	Riser Diagrams & Schedules - Sheet 1
	3746	Riser Diagrams & Schedules - Sheet 2
	3747 to 3750	Unassigned

* Lighting Plans and Details - Substation "J" and Gas Fired Air Heaters.

** Grounding Details - Including Substation "J" and Gas Fired Air Heaters.

Progress

Based on the status of the work as of February 1st, 1950 we believe that the following percentages may be considered as resonably accurate for engineering and design completion.

	No. 28	No. 30
1. Operations Building	99%	99%
Amendment #1	99	99
Amendment #2	100	100
2. Altitude Test Chambers	98	98
3. Shop and Access Building	97	98
4. Test Air Piping	88	92
Amendment #3	0	90
5. Cooling Tower & Circulating Water Sys.	90	93
6. Fuel Storage and Distribution System	85	88
7. Electrical Substations	15	18
8. Equipment Building and Equipment	18	23 ?

DRMcConathy/RDK/KBH/WGC/LHR/id

DRMcConathy/id

PSL

29970

BURNS AND ROE, INC.
ENGINEERING CONSULTANTS
233 BROADWAY
NEW YORK 7, N. Y.
TEL. BARCLAY 7-5900

March 15, 1950.

Representative of the Contracting Officer
National Advisory Committee for Aeronautics
Lewis Flight Propulsion Laboratory
Cleveland Airport
Cleveland 11, Ohio

SUBJECT: Contract NAw-5652
Architect-Engineer Services for Propulsion Sciences Laboratory Phase I, Part II, Project No. 794 - Marked Copies of Progress Reports No. 31 and 32.

Dear Sir:

Some of the problems which confront both of our organizations in the completion of the major part of the design of the Propulsion Sciences Laboratory, before May 1, become apparent from the attached marked copies of Progress Reports No. 31 and 32.

As you will note, information is needed on a great many of the items in order to complete the final design drawings. In consequence, both N.A.C.A. and Burns and Roe, Inc. must have whole-hearted and speedy cooperation from vendors in securing equipment drawings and information; and, in addition, our organizations must jointly coordinate our efforts if we are to meet the completion date established by N.A.C.A.

In order that unnecessary correspondence may be eliminated, we have marked and are transmitting two copies of Progress Reports No. 31 and 32, as agreed upon in our last meeting in Cleveland. You may have margin notes made on these copies, retain one copy for your own files, and return the other copy to Mr. D. R. McConathy.

As a matter of record, we are enclosing marked copies of Conference Notes No. 35, 36, 37, 38 and 39, and of Progress Report No. 30. The items covered in these reports, which still require attention, are - in the main - repeated in Progress Reports No. 31 and 32.

Action - JCBraig, Fop, Argans, Wilson, M.P.M.
Fhms.

No ans. nec - by progress reports

INFORMATION COPY

BURNS AND ROE, INC.

29970

Representative of the
Contracting Officer #2 March 15, 1950

As you appreciate, in the past we have been delayed in the completion of various phases of the Propulsion Sciences Laboratory design by the laek of information from vendors and - in some cases - by awaited decisions from your organization. Those conditions still prevail as indicated by the number of marked items on Progress Reports No. 31 and 32.

Anything that can be done by your organization, our own organization, or both organizations acting jointly, to expedite the receipt of the needed facts, will be of material help in speeding the completion of the final design drawings.

Cordially yours,

BURNS AND ROE, INC.

W.L.G.

WLGlenzing/del
Enclosures

Commercial Manager

PROGRESS REPORTS NO. 31 AND 32

29659

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

March 7, 1950

cc: NACA-4
EJT

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

SECTION I

This Progress Report which covers the month of February, 1950 is being revised in form to coincide with Contract Schedule tabulations dated February 24, 1950. Item Numbers referred to herein are the same as shown on Contract Schedule. See following Section for Drawing Lists.

SECTION I

Item 1 (25,000 KVA Power Transformers)

a) General location and arrangement of transformers established and approved. Question of protection walls not satisfactorily settled.

b) Awaiting manufacturers' drawings showing outline of transformers, nameplate data and wiring diagrams before design of cable vault and foundations can proceed.
Being checked by NACA Elec Station

Item 2 (Primary and Secondary Coolers)

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

b) Final drawings on primary coolers showing revised water connections have not been received.
Foster Wheeler will submit drawings thru the week of March 27.

Item 3 (Exhauster System With Motors)

R. C. submitted General Drwg. of 2nd Stage March 17.

a) Require certified drawings from Roots Connersville for second stage exhausters. We understand that the mechanical brake has been agreed upon.

b) What decision has been made as to motors operating on synchronous condensers. This question also applies to Item #4.

c) Please request Roots Connersville to tabulate...... as (a) below for Exhausters.

See Haas. 3/31

Item 4 (Compressor System With Motors)

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

See Haas. 3/31

Item 5 (Cooling Tower)

Complete.

Item 6 (Interconnecting Tie Line - Foundation)

Complete.

Item 7 (Interconnecting Tie Line - Foundation)

Complete.

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

Curves received & approved and sent to B&R.

a) Require test curves for pumps in order to determine final control scheme for both 700 and 150 hp pumps. Comments and suggestions in your letter of February 6th being held up until curves received.

Drawing returned to Contractor 2/3 approved as noted requesting corrected drwg.

b) No information has been received as yet as to final location of bearing temperature relays for pumps.

Item 9 (Structural Steel - Operations and Shop and Access Bldgs.)

Complete - Drawings finished.

Item 10 (Extension of 2400-V Pole Line)

Complete.

Item 10A (Line Relocation)

No Comment. Complete

Item 11 (Pressure Control Stations)

a) Askania to furnish the following information as soon as possible.

1. Flow diagrams - hydraulic. Information furnished March 17.
2. Wiring diagrams - electrical.
3. Pump drawings.
4. Regulator drawings.
5. Tank drawings. } Promised soon.

The above was promised at Cleveland Conference No. 36, dated February 7, 1950.

b) Henry Pratt furnished outline drawings showing arrangement and operation of cylinders for all combustion air control valves.

Item 12 (Two Sluice Gates and Mud Valves)

Complete.

Item 13 (Cooling Tower Basin and Foundation)

See Item #32 for change in cooling basin sump.

Item 14 (Altitude Test Chamber)

a) Proposed Change Order No. 16 issued February 10th.

b) Shop drawings being processed as received.

c) Your letter of February 23rd relative to alignment of shaft and locking level assembly answered.

Item 15 (Inter and After Coolers - Spec. Items #2 and #9)

Drawings promised to start coming in the week of March 27.

a) Ross Heater have not furnished drawings of accessories.

b) A problem of anchoring compressor aftercoolers will have to be settled with Ross Heater in accordance with new lay-out of compressor piping as discussed with Mr. E. Wasielewski on February 21, 1950. NACA submitted drawings on this problem to B&R March 15 - no answer from B&R to date 3/27.

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

a) Require drawings from Griscom Russell on the following:

Drawings on compressed air Intercoolers rec'd Mar 8 & Exhauster Intercooler 3/14

1. Final certified drawings for all coolers.
2. Certified drawings of drain pumps, motors and accessories. Preliminary pump Dwg Rec'd Feb 28 — No action by B&R on these items.

b) The problem of anchoring compressor intercooler will have to be taken up with Griscom Russell. This was discussed with Mr. E. Wasielewski in New York on February 21, 1950. NACA submitted drawing to B&R on this problem on March 10. No answer from B&R on this to date 3/22.

Item 17 (Operations Building) - Drawings Complete.

a) Proposed Change Order No. 18 issued on February 17, 1950.

b) Most shop drawings have been received.

c) Revised shop drawings have not been received on the switchgear and transformers, lighting and telephone circuiting.

d) Awaiting information from NACA as to the status of switching for corridor lights.

Item 18 (Shop and Access Building) - Drawings Complete.

Partial shop drawings sent to B&R 2/10. Ret. by B&R 3/9 to contractor 3/13 for correction.

a) Proposed Change Order No. 15 issued on February 10.

b) Proposed Change Order No. 17 issued on February 17.

Estimate questioned by B&R 3/3 (?) incomplete answer rec 3/10. Complete answer by NACA 3/24.

c) These change orders provide the necessary information for Emerson to continue construction. This completes changes necessitated by the relocation of the orifice run.

d) The Cardox system is being restudied relative to locating tanks adjacent to 13' diameter exhaust header. We understand that Mr. Lehr is working up a sketch with Mr. Rogers, the Chicago representative of the Cardox Company.

e) Require shop drawings for control cubicle-outline and wiring diagrams.

Item 19 (Fuel Storage Tanks)

All shop drawings complete except some accessory drawings have not been returned in corrected form. 3/22/50 - all dwgs in. OK

OK

b) Starting proposal drawing covering installation of anodes for cathodic protection which are to be installed for the underground fuel storage tanks. This will require Change Order to the Hammond contract. Plan on including this in fuel piping contract. (See Dan.)

Item 20 (Telephone Addition)

No comment.

Item 21 (Exh. Gas Duct Expansion Joints)

Revised drawings received from Zallea Brothers February 27, 1950. Approved complete

Item 22 (Fuel Filters)

Final drawings received and returned.

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

Shop drawings are being processed.

Item 23A. (Substation "C" Switchgear)

Shop drawings are being processed.

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

a) Bid analysis tabulation received. Awaiting N.A.C.A. decision as to award. awarded to Standard Transformer Na 3-1133.

b) Shop drawings required as soon as possible for design information.

Item 24 (Gas Fired Air Heaters)

a) Layout of air heaters and piping is being made on the basis of proposal drawings using Petro Chemical vertical heaters for bottom air inlet and top outlet.

b) Burns and Roe are establishing location of inlet and outlet flanges. Will advise.

c) NACA to obtain certified drawings from vendors before final drawings of piping and foundations can be made.

d) Please request Petro Chemical to furnish list of accessories including wiring diagrams, controls, panel boards, electrical requirements, etc. immediately. NACA will make request.

Item 25 (Exhaust Gas Duct System)

a) Drawings being revised to accommodate Zallea Brothers revised expansion joints and exhaust gas control valves and combustion air by-pass as determined. Locking drawings on valves - Item #11. Drwgs complete — out for quotation.

b) Carter drawings showing general arrangement will be returned when above work is complete. Expect to return Carter drawings March 3rd. complete

Item 26 (Two 48" Motor Operated Gate Valves)

a) Awaiting shop drawings. Require outline dimensions for valve, operator details, electrical requirements, wiring diagrams, etc. Expected week of 3/20

b) Control was eliminated in buying motor operators. NACA please advise whether local and remote control devices are to be furnished as part of the primary electrical contract.

Item 27 (Variable Frequency Starting and Exciting Equipment)

a) The following shop drawings are required. See Mass

1. Outline drawings showing foundation requirements, etc. for the variable frequency motor generator. } B&R rec'd 3/27 KC
2. Motor generator exciter. - Same information.
3. Outline dimensions for slip regulator listed in your letter of February 24, 1950.
4. List of auxiliaries and hp requirements associated with slip regulator required. } not available 3/30 KC
5. Wiring diagram of associated auxiliaries.

b) The receipt of the above shop drawings will permit Burns and Roe to establish equipment layout and arrangement for the northwest corner of the Equipment Building.

Item 28 (Safety Discs and Diaphragms)

Complete.

Item 29 (Combustion Air Piping System)

a) At Conference No. 36 in Cleveland on February 7th, NACA requested further changes in combustion air piping. This required revisions to drawings CE-104503, 506 which were issued to NACA for approval on February 3rd.

b) A study drawing is now being made of the new arrangement along the lines discussed, and revised drawings will be issued for final approval about March 10th. If these drawings are satisfactory, release to vendors may be made.

c) All changes necessitated by relocation of the orifice outside of the Shop and Access Building have not been made.

Item 30 (Circulating Water Piping System)

Final drawings and specifications sent to NACA on Feb. 17th.

Item 31 (Fuel Piping System)

a) Approval drawings and specifications being reviewed by NACA. Burns and Roe awiating comments before final issue.

b) Drawings being finally checked. (March 15th intended date of final sepia release to NACA).

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

a) Addition of water treatment Equipment Building to C.W. pump house being made. Concrete duct from cooling tower being eliminated. Change Order to Hansen will be issued for change in Contract NAW-5851. Revision for booster pump pit at basin to follow later.

b) Trench for combustion air headers will be revised when status discussed under Item 29 is complete.

Item 32A. (HP Fuel Pump House)

Design drawings for the HP Fuel Pump House are approximately 50% complete. Design progressing satisfactorily.

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

Final specifications and drawings will be sent to NACA during the week of March 6th.

Item 34 (Combustion Air Heater Piping)

Work included under Item 54.

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

a) Drawings sent to NACA for final approval on February 27th except for access platforms to exhaust gas control valves.

b) Specification is being prepared.

Item 36 (Thermal Insulation (1st Step Construction)

No work being done.

Item 37 (Thrust Platform Mechanical)

a) Drawing being revised to agree with last NACA comments. Sepia will be issued to NACA by March 3rd.

b) Final specifications are being prepared by NACA from Burns and Roe's draft.

Item 38 (Panel Boards - Shop and Access Building)

Work cannot proceed until full information is available on control systems.

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

Cannot proceed until more specific information is available.

Item 40A,B,C,D, and E (Water Treatment System)

a) Burns and Roe working with Sheppard T. Powell in determining design information for softening system and vacuum deaeration system.

b) Information on vacuum pumps and booster pumps available from NACA stock to be forwarded to Burns and Roe.

c) No decision has been made as to the amount of steam available for steam ejectors on vacuum deaerators if steam ejection is to be considered.

d) Preliminary studies and arrangements being made for entire system.

Item 41 (7" Dia. Air Line Installation)

Air headers required for the Shop and Access Building and Primary Cooler areas have been included in the circulating water piping contract. Additional air distribution headers for Shop and Access Building and other equipment in the area and to the Equipment Building will be included in either service piping contract for the Equipment Building or control and instrumentation piping.

Item 42 (Fuel Metering Equipment)

NACA preparing specification for purchase.

Item 43 (Fuel Pressure Control System)

Specification issued awaiting bids.

Item 44 (HP and LP Fuel Pumps)

All design drawing information received. Additional shop drawings required.

Item 44A. (Gasoline Drainage Pumps)

Awaiting award of bid and shop drawings.

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

a) Awaiting shop drawings. Require outline dimension for valve, operator details, electrical requirements, wiring diagrams, etc. Outline dimension drawing submitted in Jan '50.

b) Control was eliminated in buying motor operators. NACA to advise whether local and remote control devices are to be furnished as part of the primary electrical contract. See Haas NACA to furnish local control. B&R to furnish remote control in control room.

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

After recent decision to use flow control on air mixing system two additional valves are required. Specification by Burns and Roe not yet started. - Need promise date from Spec.

Item 46 (Orifice and Metering Combustion Air)

Information complete. Drwgs approved. Feb 17.

Item 47 (Expansion Joints - C. W. System)

Awaiting shop drawings from U. S. Rubber and Zallea Bros. 3/22/50 - Mfrs. in. Corrected drawing in process for approval.

Item 48 (Expansion Joints - Combustion Air System)

a) Expansion joint specification sent to NACA for approval on February 6th. Release held until final combustion air piping system is decided upon. Spec. out for bid.

Item 49 (Pressure Gages, Therm. and Test Wells - 1st Step Construction)

No work being done.

Item 50 (Fire Protection - 1st Step)

a) Proposals submitted by Cardox Company showing separate systems for Shop and Access Building and High Pressure Fuel Pump House.

b) NACA (Mr. Lehr) is considering a system to combine Equipment Building with location of combined tanks adjacent to 13' diameter gas header duct.

c) Burns and Roe reviewing details with NY representative of Cardox.

d) It is our understanding that NACA after reviewing all systems with Mr. ~~Rogers~~ Lannert (~~Chicago~~ Cleveland representative) will submit a diagram and explanatory information.

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

a) Final drawings are being made for foundations for compressors and first stage exhauster.

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

1. Secondary stage exhauster.
2. Starting M-G set, slip regulators, etc.
3. Expander turbine.
4. Electrical switchgear, misc. control panels and exciters.
5. Refrigeration and air drying equipment.
6. Transformers and induction regulators.
7. Gas fired air heaters.

c) Final Architectural and Structural drawings are progressing based on decisions as agreed upon and recorded in Conference Notes No. 39 dated 3/7/50.

d) The following additional information is required from NACA.

1. Final official approval of building exteriors. Completed
2. Absorption coefficient of sound absorption panels for use in the exhaust stacks and air intake stacks. These are panels which NACA have on hand. Complete
3. Heating and ventilating studies indicate that a suitable system embodies forced supply into the basement area - through openings in the operating floor to individual ventilators through the roof. This is not in accordance with NACA specification but we understand is satisfactory.

e) Low intake stacks at the north end of the building with throwaway type filters are contemplated.

f) Preliminary study of general arrangement of control room will be made and suggestions submitted.

g) It is contemplated that single contract will include building substructure, superstructure, building steel and equipment foundations.

h) Drawings are in progress showing new "T" type manhole #86, new power duct bank and new telephone duct bank associated with this building contract.

Item 53 (Primary Electrical Work - Equipment Building Area)

a) Preliminary study drawings showing locations and motor control center unit, substation and exciter sent to NACA on February 28th.

b) Connections between main transformer and starting switchgear will consist of cable rather than bus duct.

c) Study drawings covering connections between switchgear and main motors in progress.

d) Drawings covering building lighting in progress.

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

a) Layouts showing arrangement of the expansion joints and anchor points have been completed for the compressors and first stage exhauster and preliminary arrangement has been developed for second stage exhauster.

b) Final certified information on Griscom Russell coolers and second stage exhauster is delaying design of piping. March 9 & 14 drawings submitted to B&R.

c) The air and gas piping will be arranged in such a way as to permit a tow truck passage of 8' high and 8' wide along both sidewalls of the basement area and through the center aisle. Free passage to the access door at the south end of the building will be maintained. It seems unnecessary and impractical to raise piping and coolers to permit transverse passage through the systems other than for personnel.

d) Piping from Equipment Building around air heaters and to headers is being developed. Burns and Roe will advise NACA most practical flange locations for air heaters.

e) Piping from air compressor aftercooler through refrigeration and drying system to expander turbine cannot be developed until information is available.

Item 55 (Gen. Serv. Piping Equipment Building Area) - Preliminary Study Only

Item 56 (Refrigeration Equipment and Piping)

a) Two refrigeration vendors have studied air cooling and drying with mechanical systems and estimated costs have been ascertained.

b) Chemical drying concerns have been contacted by NACA and Conference arranged in Cleveland for March 3rd.

c) The results of the March 3rd Conference are to then be compared with the mechanical refrigeration studies relative to costs and procedures decided upon.

Item 56A. (Expander Turbine) Out on bid.

a) NACA negotiating contract with Elliott Company for manufacture of expander turbine.

b) Shop drawing information required as soon as possible.

Item 57 (Thermal Insulation - 2nd Step Construction)

No work being done.

Item 58 (Compressor System - Controls)

Amendment #5 to Specification C-550 issued to Elliott for quotation. Burns and Roe awaiting results.

Item 59 (Exh. System - Controls)

Amendment #6 to Specification C-550 issued to Roots Connersville. Burns and Roe awaiting results.

Item 60 (Check Valves - Exh. and Compressor Systems) Should be pushed - item considered long delivery

Specifications are being prepared.

Items 61 and 62 - (Butterfly Valves - Exh. Gas System) - do
(Rubber Expansion Joints at Machines) B&R

Specifications are being prepared for these items and will be issued for NACA's approval as soon as possible. Another long delivery item - should be pushed

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

Specifications will be prepared as soon as data is available. Should be pushed to hold proper construction schedule.

Item 63 (Combustion Air System)

Specifications will be prepared as soon as data is available.

Item 65 (Lube Oil System)

a) Study of the L.O. System has been made on the basis of preliminary information received from both Roots Connersville and Elliott Company.

b) Burns and Roe have requested NACA to obtain from both vendors complete and final information on quantities and pressures of lubricating oil for both the exhausters and compressors and their driving motors. We must have this information before we can complete our study. R.C. have submitted letter covering — See Berg.

Item 66 (Building Cranes)

a) Specifications are being prepared based on using Cab operated cranes with provisions for a future transfer between bays.

Item 67 (Exh. and Compressor Control Panels)

Awaiting information from NACA on Items 58 and 59 to develop these panels.

Item 68 (Inst. Gages and Test Wells - 2nd Step)

No work being done.

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

a) Specification being prepared to cover unit substation and motor control center equipment.

b) Specification for motor control center equipment cannot be complete until details of various buildings and equipment auxiliaries have been decided upon as to hp requirements.

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

a) Awaiting opening of bids on this equipment.

b) It is important that outline drawings be obtained as quickly as possible from successful bidders in order to complete lay-out and arrangement of electrical bay and outdoor transformer substation. Certified dwgs. due 4/6.

Item 73 (34.5 KV Cable Installation)

Specification in progress to be forwarded week of March 13th.

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

a) No comments received to-date from NACA of preliminary study drawings showing arrangement of switchgear and new and existing bays at Substation "G". This will cause delay in the preparation of specification drawings for this equipment.

b) Preliminary drawing showing location of reactors in substation "B" discussed with NACA.

c) Relocation for final 7% at 48 MVA reactors will be included on specification drawings.

d) Specification in progress covering various switching and structure equipment required in substations "B" and "G".

Item 76 (Primary Electrical Work Substation Area)

Information not available. ~~what information~~ is needed from NACA if any.

Item 77 (Intercommunication System)

No progress.

Item 78 (Installation Contract - Misc. Mech. and Elec. Equipment)

No progress.

SECTION II - Progress of Contract Drawings will be forwarded in a day or two to be attached to this Progress Report.

DRMcConathy/KBH/LHR/RDK/id

SECTION II

The following items contain drawing lists of the work which requires completion within the May 1st deadline. The grouping of drawings within the contracts listed is substantially complete except for reference drawings. A careful study is being made on these drawings which will be added in the next Progress Report issue.

You will note that progress against all drawings is not shown. In some cases the work has not been started other than preliminary study, while in other cases considerable work may have been done in sketch form but is not truly reflected upon the progress of the particular drawing.

LIST OF CONTRACT DESIGN DRAWINGS

ITEM 29 - COMBUSTION AIR PIPING (1st Step)

Mechanical		No. 30	No. 31 & 32
CE-104503 (2310)	Combustion Air Piping Headers to Test Chambers - Plans, Elevations and Details	85%	90%
CE-104506 (2313)	Combustion Air Piping - Supports, Anchors and Miscellaneous Details	75	90
Reference Drawings			
CE-104511 (2318)	Combustion Air Piping Arrangement of Control Valves & Supports at Test Chambers	0	10
CE-104501 (2301)	Air and Gas Piping First & Second Step Gen. Arrangement Plan	78	80
CE-104502 (2302)	Air and Gas Piping First & Second Step Gen. Arrangement Elev.	78	80
CE-104507 (2314)	Air and Gas Piping First and Second Step Expansion Joint List	50	50
CE-104508 (2315)	Air and Gas Piping First & Second Step Valve List	30	30
CE-104551 (3302)	Air and Gas Piping Grounding System - Plant Details	100	100

ITEM 32A. - HIGH PRESSURE FUEL PUMP HOUSE & SEPARATOR PITS

Structural		No. 30	No. 31 & 32
CE-104643 (4504)	Pump Floor & Metering Floor Roof & Plot Plan Elevs.	5%	90%
CE-104644 (4505)	Elevations	5	90
CE-104645 (4506)	Typical Wall, Window, Door & Stair Details	5	90
CE-104646 (4507)	Plumbing & Finish Schedule		
CE-104649 (4510)	Piling Plan, Foundations	0	0
	Pump Floor & Details	30	75
CE-104650 (4511)	Framing Plan - Metering Fl., Roof, Col. Sched. and Details	0	75
CE-104651 (4512)	Elevations and Details	0	0
Electrical			
CE-104658 (3504)	HP Fuel Pump House Lighting and Details	0	80
Mechanical			
CE-104620 (2511)	HP Pump House - Heating Ventilating and Details	0	0

Reference Drawings - To be assigned later.

ITEM 33 - PRIMARY ELECTRICAL WORK (1st Step Construction)

Electrical			
CE-104550 (3301)	Outdoor Area Lighting & Receptacle Plans and Details	100	100
CE-104551 (3302)	Air and Gas Piping - Grounding System Plans and Details	100	100
CE-104594 (3402)	C.W. P.H. - One Line Diag. Swgr. & Transf. Arrg't Plan	95	95
CE-104596 (3403)	C.W. Pump House - Equipment Grounding - Conduit Plans and Details	80	90
CE-104597 (3404)	Cooling Tower - Lighting Plan and Details	100	100
CE-104598 (3405)	Cooling Tower - Conduit and Grounding Plans and Details	100	100
CE-104599 (3406)	Power Ducts & Manhole Details	100	100
CE-104600 (3407)	Substation "C" Arrangement Plan and Details	100	100

Electrical (Continued)		No. 30	No. 31 & 32
CE-104656 (3502)	LP Fuel Pump House - Equipment Grounding, Conduit Plan and Details	77	90
CE-104657 (3503)	Fuel Storage Area - Outdoor Lighting and Conduit Plan	100	100
CE-104660 (3506)	Telephone & Intercommunication Ducts and Manhole Details	75	95
CE-104659 (3505)	HP Fuel Pump House - Equipment Grounding, Conduit Plan and Details	0	80
CE-104602 (3409	C.W. & Fuel Distribution System Conduit and Cable Schedule	0	0
Structural			
CE-104586 (4410)	Electrical Manholes - Details	0	90
Reference Drawing			
CE-104601 (3408)	One Line Diagram - 1st Step Construction - Phase I	75	95
ITEM 36 - PLATFORMS, WALKWAYS AND STAIRWAYS			
Structural			
CE-104540 (4310)	Walkways and Stairways - Test Chamber & Pri. Coolers, Elevations and Sections	95	95
CE-104541 (4311)	Walkways & Stairways Test Chamber & Pri. Coolers, Sections and Details	95	95
CE-104546 (4318)	Misc. Walkways, Platforms, Ladders, etc.	9	30
ITEM 39 - CONT. & INSTR. PIPING - 1ST STEP			
Mechanical			
CE-104509	Control Piping, Plans, Elev. and Details	0	0
CE-104510	Control Piping - Sections & Details	0	0

Reference Drawings - To be assigned later.

ITEM 40C. - VACUUM DEAERATOR SYSTEM

General Arrangement - Tanks
Tank Details and Internals
Deaerating Tanks and Fabricated Piping
Plans and Details
Deaerating Tanks and Fabricated Piping
Sections and Details
Structural Steel Supports - Deaerating Tanks

Reference Drawings - To be assigned later.

ITEM 40D. - PIPING SYSTEM - WATER TREATMENT SYSTEM

Flow Diagram
Plot Plan - Location and Interconnections
Softeners - Plan, Elevations and Details
Softeners - Elevations, Sections and Details
Small Piping at Vacuum Deaerators

Reference Drawings - To be assigned later.

ITEM 40E. - CONCRETE AND BUILDING STRUCTURES - WATER TREATMENT SYSTEM

Drawings under Contract #NAw-5851 revised to include building and possibly two (2) new drawings added. (Hansen Contract)

Foundations and Details - Brine Tank
Foundations and Details for Vacuum Deaerator
Foundation Well and Details - Booster Pumps

Note: Electrical work in connection with Water Treatment may be added to Contract for Item #53 - Primary Electrical Work - Equipment Building Area.

ITEMS 51 and 52 - EQUIPMENT BUILDING

Architectural		No. 30	No. 31 & 32
4701	Plot Plan		3
4702	Basement Plan		0
4703	Operating Floor Plan		25
4704	Roof Plan		2
4705	Mezz. Plan and Sections - Control Room		5
4706	Mezz. Plan and Sections - Elec. Mezz.		5
4707	Control Room Details		0
4708	North Elevation		40
4709	South Elevation		40
4710	East Elevation		40
4711	West Elevation		40
4712	Transverse Section		

Architectural (Continued)		No. 30	No. 31 & 32
4713	Longitudinal Section		20
4714	Typical Wall & Window Details-sheet 1		5
4715	Typical Wall & Window Details-sheet 2		0
4716	Typical & Special Door Details		0
4717	Entrance Details		0
4718	Toilet & Locker Room Details		0
4719	Stair & Railing Details - Plans - Sheet 1		5
4720	Stair & Railing Details - Plans - Sheet 2		0
4721	Misc. & Spec. Details - Sheet 1		4
4722	Misc. & Spec. Details - Sheet 2		4
4723	Cold & Hot Water Piping Plans		0
4724	Cold & Hot Water Piping - Sections		0
4725	Sanitary & Storm Sewer Piping - Plan		0
4726	Sanitary & Storm Sewer Piping - Section		0
4727	Schedules, Windows, Doors, Hardware, Finish		0
Structural (Superstructure)			
4731	Roof Framing Plan		20
4732	Roof Truss		10
4733	Control Room Mezz. Framing Plan		0
4734	Electrical Mezzanine Framing Plan		0
4735	Operating Floor Framing Plan		5
4736	Col. Sched. & Crane Girder Details		10
4737	Col. Line Elevations - East & West Walls		0
4738	Col. Line Elevations - North & South Walls		0
Structural (Substructure and Foundations)			
4746	Building Foundation Plan		0
4748	Basement Floor Plan		0
4749	Conc. Encl. for Intake & Exh. Pipe		0
4750	Compressor Foundation Sheet 1		40
4751	Compressor Foundation Sheet 2		10
4753	1st Stage Exhauster Foundation - Sheet 1		50
4754	1st Stage Exhauster Foundation - Sheet 2		0
4755	2nd Stage Exhauster Foundation - Sheet 1		10
4756	2nd Stage Exhauster Foundation - Sheet 2		0
4757	Motor Generator Set Foundations - Sheet 1		0
4758	Motor Generator Set Foundations - Sheet 2		0
4759	Misc. Equipment Foundations		0
4770	Air Heater Foundations		0
4771	Transformer Foundations		0
4772	Refrigeration Equip. Foundations Sheet 1		0
4773	Refrigeration Equip. Foundations Sheet 2		0
Mechanical			
2771	Heating and Ventilating System		10
2712	Heating and Ventilating System		10
2713	Heating and Ventilating System		10
2714	Heating and Ventilating System		10
2715	Control Room Air Cond. System		0
2716	Floor Openings		0

Electrical

3701 - Lighting and Grounding Plan - Basement Floor
3702 - Lighting Plan - Basement Mezzanine
3703 - Lighting Details - Basement Floor & Mezz.
3704 - Lighting Plan - Operating Floor
3705 - Lighting Plan - Control Room & Utility Mezz.
3706 - Lighting Details - Operating Floor & Mezz.
3707 - Lighting Plans and Details - Substation "J" and Gas Fired Air Heaters
3708 - Arrangement Plan - Substation "J"
3709 - Elevations & Sections - Substation "J"
3710 - Elevations & Sections - Electrical Bay
3711 - Grounding Details - Including Substation "J" and Gas Fired Air Heaters
3712 - Underground Ductlines and Manhole Details
3713 - Telephone and Signal System - Underground Services

Reference Drawings		No. 30	No. 31 & 32
2701	Operating Floor	10	15
2702	Basement Floor Plan	10	12
2703	Mezzanine Floor Plans	0	0
2704	Cross Sections (2)	10	12
2705	Cross Sections (2)	0	0
2706	Longitudinal Sections (2)	5	7
2707	Longitudinal Sections (2)	0	5

ITEM 54 - AIR AND GAS PIPING EQUIPMENT BUILDING & AIR HEATER AREA

Mechanical

2721	Exh. & Comp. Bleed Piping	0	0
2722	Comb. Air Piping - Equip. Building	0	10
2723	Combustion Air Piping Equip. Bldg. to Air Heaters & Distributing Header - Elev. & Sections	0	10
2724	Combustion Air Piping - After Coolers to Refrig. Sys- Plan	0	5
2725	Comb. Air Piping - After Cooler to Refrig. System - Elevations and Sections	0	5
2726	Comb. Air Piping - Medium and Low Temperature Air from Equip. Bldg. to Dist. Headers - Plans	0	5
2727	Comb. Air Piping - Medium & Low Temp. Air from Equip. Bldg. to Dist. Headers, Elev. & Sections	0	5

Reference Drawings - To be assigned later.

The following is a list of additional contracts with preliminary listing of design drawings to be prepared after the May 1st deadline. The majority of this work is awaiting information resulting from purchase of equipment or requirements needing considerable study before release.

ITEM 53 - PRIMARY ELECTRICAL WORK - EQUIPMENT BUILDING AREA

Electrical

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 drawing - To be assigned later.

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

Mechanical

		No. 30	No.31 & 32
2731	Circulating Water Piping Plan	0	0
2732	Circulating Water Piping Elev.	0	0
2733	Circulating Water Piping Sections	0	0
2734	Circulating Water Piping Details	0	0
2735	Utility Compressed Air Piping - Plan		
2736	Utility Compressed Air Piping Elevations and Sections		

(Item 55 Continued)

		No. 30	No. 31 & 32
2737	Intercooler Drain Piping	0	0
2738	Lubricating Oil Piping - Plan	0	10
2739	Lubricating Oil Piping - Elevations and Sections	0	10

Reference drawing - To be assigned later.

ITEM 56 - REFRIGERATION EQUIPMENT AND PIPING

Mechanical

2741	Gen. Arrgt Plan of Refrigeration and Drying System	0	0
2742	Gen. Arrgt Elevations of Refrigeration and Drying System	0	0
2743	Gen. Arrgt Sections of Refrigeration and Drying System	0	0

Reference drawing - To be assigned later.

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

Mechanical

2751	Instrument Listw	0	0
2752	Instrument Lists	0	0
2753	Instrument Piping - Plan	0	0
2754	Instrument Piping - Elevations and Details	0	0
2755	Control Air Piping - Plan	0	0
2756	Control Air Piping - Elev. and Details	0	0
2757	Hydraulic Valve- Oil Piping - Plan	0	0
2758	Hydraulic Valve - Oil Piping - Details	0	0

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	0	0

Reference drawing - To be assigned later.

ITEM 73 - (34.5 KV CABIE INSTALLATION

Electrical	No. 30	No. 31 & 32
3607 Plot Plan - Manhole Developments 34.5KV Cable Route	0	40
3611 Manhole and Cable Vault Developments, 34.5KV Cable Route	0	0

Reference Drawings - To be Assigned Later.

SECTION II

The following items contain drawing lists of the work which requires completion within the May 1st deadline. The grouping of drawings within the contracts listed is substantially complete except for reference drawings. A careful study is being made on these drawings which will be added in the next Progress Report issue.

You will note that progress against all drawings is not shown. In some cases the work has not been started other than preliminary study, while in other cases considerable work may have been done in sketch form but is not truly reflected upon the progress of the particular drawing.

LIST OF CONTRACT DESIGN DRAWINGS

ITEM 29 - COMBUSTION AIR PIPING (1st Step)

Mechanical		No. 30	No. 31 & 32
CE-104503 (2310)	Combustion Air Piping Headers to Test Chambers - Plans, Elevations and Details	85%	90%
CE-104506 (2313)	Combustion Air Piping - Supports, Anchors and Miscellaneous Details	75	90
Reference Drawings			
CE-104511 (2318)	Combustion Air Piping Arrangement of Control Valves & Supports at Test Chambers	0	10
CE-104501 (2301)	Air and Gas Piping First & Second Step Gen. Arrangement Plan	78	80
CE-104502 (2302)	Air and Gas Piping First & Second Step Gen. Arrangement Elev.	78	80
CE-104507 (2314)	Air and Gas Piping First and Second Step Expansion Joint List	50	50
CE-104508 (2315)	Air and Gas Piping First & Second Step Valve List	30	30
CE-104551 (3302)	Air and Gas Piping Grounding System - Plant Details	100	100

PROGRESS REPORTS NO. 31 AND 32

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

March 7, 1950

cc: NACA-4
EJT

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

SECTION I

This Progress Report which covers the month of February, 1950 is being revised in form to coincide with Contract Schedule tabulations dated February 24, 1950. Item Numbers referred to herein are the same as shown on Contract Schedule. See following Section for Drawing Lists.

SECTION I

Item 1 (25,000 KVA Power Transformers)

a) General location and arrangement of transformers established and approved. Question of protection walls not satisfactorily settled. B&R notified by P.S.L. of decision. See Conference report #40

b) Awaiting manufacturers' drawings showing outline of transformers, nameplate data and wiring diagrams before design of cable vault and foundations can proceed.
G.E. mailed to B&R 3/3 — Being checked by NACA Elec Section

Item 2 (Primary and Secondary Coolers)

a) Require comments from Foster Wheeler on arrangement of installation of vents with respect to clearing walkways. [illegible] March 21)

b) Final drawings on primary coolers showing revised water connections have not been received.
Foster Wheeler will submit drawing the week of March 27.

Item 3 (Exhauster System With Motors)

a) Require certified drawings from Roots Connersville for second stage exhausters. We understand that the mechanical brake has been agreed upon. R.C. submitted General Drwg of 2nd Stage March 17

b) What decision has been made as to motors operating on synchronous condensers. This question also applies to Item #4. See Haas

c) Please request Roots Connersville to tabulate..... as (a) below for Exhausters.

Item 4 (Compressor System With Motors) See Haas

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

Item 5 (Cooling Tower)

Complete.

Item 6 (Interconnecting Tie Line - Foundation)

Complete.

Item 7 (Interconnecting Tie Line - Foundation)

Complete.

Item 8 (Two C.W. Pumps With Motors) curves received - approved and sent to B & R.

a) Require test curves for pumps in order to determine final control scheme for both 700 and 150 hp pumps. Comments and suggestions in your letter of February 6th being held up until curves received.

b) No information has been received as yet as to final location of bearing temperature relays for pumps. drawing returned Contractor 2 3 approved as noted requesting corrected drwg matter to be settled between Ingersoll Rand and G.E. Co.

Item 9 (Structural Steel - Operations and Shop and Access Bldgs.)

Complete - Drawings finished.

Item 10 (Extension of 2400-V Pole Line)

Complete.

Item 10A (Line Relocation)

No Comment. Complete

Item 11 (Pressure Control Stations)

a) Askania to furnish the following information as soon as possible.

1. Flow diagrams - hydraulic.
2. Wiring diagrams - electrical.
3. Pump drawings.
4. Regulator drawings.
5. Tank drawings.

} Furnished soon

The above was promised at Cleveland Conference No. 36, dated February 7, 1950.

b) Henry Pratt furnished outline drawings showing arrangement and operation of cylinders for all combustion air control valves.

Item 12 (Two Sluice Gates and Mud Valves)

Complete.

Item 13 (Cooling Tower Basin and Foundation)

See Item #32 for change in cooling basin sump.

Item 14 (Altitude Test Chamber)

a) Proposed Change Order No. 16 issued February 10th.

b) Shop drawings being processed as received.

c) Your letter of February 23rd relative to alignment of shaft and locking level assembly answered.

Item 15 (Inter and After Coolers - Spec. Items #2 and #9)

a) Ross Heater have not furnished drawings of accessories.

b) A problem of anchoring compressor aftercoolers will have to be settled with Ross Heater in accordance with new lay-out of compressor piping as discussed with Mr. E. Wasielewski on February 21, 1950.

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

a) Require drawings from Griscom Russell on the following:

1. Final certified drawings for all coolers.
2. Certified drawings of drain pumps, motors and accessories.

b) The problem of anchoring compressor intercooler will have to be taken up with Griscom Russell. This was discussed with Mr. E. Wasielewski in New York on February 21, 1950.

Item 17 (Operations Building) - Drawings Complete.

a) Proposed Change Order No. 18 issued on February 17, 1950.

b) Most shop drawings have been received.

c) Revised shop drawings have not been received on the switchgear and transformers, lighting and telephone circuiting.

d) Awaiting information from NACA as to the status of switching for corridor lights.

Item 18 (Shop and Access Building) - Drawings Complete.

a) Proposed Change Order No. 15 issued on February 10.

b) Proposed Change Order No. 17 issued on February 17.

c) These change orders provide the necessary information for Emerson to continue construction. This completes changes necessitated by the relocation of the orifice run.

d) The Cardox system is being restudied relative to locating tanks adjacent to 13' diameter exhaust header. We understand that Mr. Lehr is working up a sketch with Mr. Rogers, the Chicago representative of the Cardox Company.

e) Require shop drawings for control cubicle-outline and wiring diagrams.

Item 19 (Fuel Storage Tanks)

All shop drawings complete except some accessory drawings have not been returned in corrected form.

b) Starting proposal drawing covering installation of anodes for cathodic protection which are to be installed for the underground fuel storage tanks. This will require Change Order to the Hammond contract.

Item 20 (Telephone Addition)

No comment.

Item 21 (Exh. Gas Duct Expansion Joints)

Revised drawings received from Zallea Brothers February 27, 1950. approved complete

Item 22 (Fuel Filters)

Final drawings received and returned.

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

Shop drawings are being processed.

Item 23A. (Substation "C" Switchgear)

Shop drawings are being processed.

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

a) Bid analysis tabulation received. Awaiting N.A.C.A. decision as to award. awarded to Standard Transformer NAS 1133

b) Shop drawings required as soon as possible for design information.

Item 24 (Gas Fired Air Heaters)

a) Layout of air heaters and piping is being made on the basis of proposal drawings using Petro Chemical vertical heaters for bottom air inlet and top outlet.

b) Burns and Roe are establishing location of inlet and outlet flanges. Will advise.

c) NACA to obtain certified drawings from vendors before final drawings of piping and foundations can be made.

d) Please request Petro Chemical to furnish list of accessories including wiring diagrams, controls, panel boards, electrical requirements, etc. immediately. NACA will make request.

Item 25 (Exhaust Gas Duct System)

a) Drawings being revised to accommodate Zallea Brothers revised expansion joints and exhaust gas control valves and combustion air by-pass as determined. Locking drawings on valves - Item #11. Drawings complete-out for approval

b) Carter drawings showing general arrangement will be returned when above work is complete. Expect to return Carter drawings March 3rd. complete

Item 26 (Two 48" Motor Operated Gate Valves)

a) Awaiting shop drawings. Require outline dimensions for valve, operator details, electrical requirements, wiring diagrams, etc. Expected week of 3/20.

b) Control was eliminated in buying motor operators. NACA please advise whether local and remote control devices are to be furnished as part of the primary electrical contract. See Haas

Item 27 (Variable Frequency Starting and Exciting Equipment)

a) The following shop drawings are required. See Haas

1. Outline drawings showing foundation requirements, etc. for the variable frequency motor generator.
2. Motor generator exciter. - Same information.
3. Outline dimensions for slip regulator listed in your letter of February 24, 1950.
4. List of auxiliaries and hp requirements associated with slip regulator required.
5. Wiring diagram of associated auxiliaries.

b) The receipt of the above shop drawings will permit Burns and Roe to establish equipment layout and arrangement for the northwest corner of the Equipment Building.

Item 28 (Safety Discs and Diaphragms)

Complete.

Item 29 (Combustion Air Piping System)

a) At Conference No. 36 in Cleveland on February 7th, NACA requested further changes in combustion air piping. This required revisions to drawings CE-104503, 506 which were issued to NACA for approval on February 3rd.

b) A study drawing is now being made of the new arrangement along the lines discussed, and revised drawings will be issued for final approval about March 10th. If these drawings are satisfactory, release to vendors may be made.

c) All changes necessitated by relocation of the orifice outside of the Shop and Access Building have not been made.

Item 30 (Circulating Water Piping System)

Final drawings and specifications sent to NACA on Feb. 17th.

Item 31 (Fuel Piping System)

a) Approval drawings and specifications being reviewed by NACA. Burns and Roe awiating comments before final issue.
Comments given to B2R by H. Lehr & Dan Williams

b) Drawings being finally checked. (March 15th intended date of final sepia release to NACA).

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

a) Addition of water treatment Equipment Building to C.W. pump house being made. Concrete duct from cooling tower being eliminated. Change Order to Hansen will be issued for change in Contract NAW-5851. Revision for booster pump pit at basin to follow later.

b) Trench for combustion air headers will be revised when status discussed under Item 29 is complete.

Item 32A. (HP Fuel Pump House)

Design drawings for the HP Fuel Pump House are approximately 50% complete. Design progressing satisfactorily. what time will for completion?

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

Final specifications and drawings will be sent to NACA during the week of March 6th.

Item 34 (Combustion Air Heater Piping)

Work included under Item 54.

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

a) Drawings sent to NACA for final approval on February 27th except for access platforms to exhaust gas control valves.
Drawing passed on to Foster Wheeler for their check.

b) Specification is being prepared.

Item 36 (Thermal Insulation (1st Step Construction)

No work being done.

Item 37 (Thrust Platform Mechanical)

a) Drawing being revised to agree with last NACA comments. Sepia will be issued to NACA by March 3rd.

b) Final specifications are being prepared by NACA from Burns and Roe's draft.

Item 38 (Panel Boards - Shop and Access Building)

Work cannot proceed until full information is available on control systems.

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

Cannot proceed until more specific information is available.

Item 40A,B,C,D, and E (Water Treatment System)

a) Burns and Roe working with Sheppard T. Powell in determining design information for softening system and vacuum deaeration system.

b) Information on vacuum pumps and booster pumps available from NACA stock to be forwarded to Burns and Roe. - See Dan Williams

c) No decision has been made as to the amount of steam available for steam ejectors on vacuum deaerators if steam ejection is to be considered. See Dan Williams

d) Preliminary studies and arrangements being made for entire system.

Item 41 (7" Dia. Air Line Installation)

Air headers required for the Shop and Access Building and Primary Cooler areas have been included in the circulating water piping contract. Additional air distribution headers for Shop and Access Building and other equipment in the area and to the Equipment Building will be included in either service piping contract for the Equipment Building or control and instrumentation piping.

Item 42 (Fuel Metering Equipment)

NACA preparing specification for purchase.

Item 43 (Fuel Pressure Control System)

Specification issued awaiting bids.

Item 44 (HP and LP Fuel Pumps)

All design drawing information received. Additional shop drawings required.

Item 44A. (Gasoline Drainage Pumps)

Awaiting award of bid and shop drawings.
Award made to Strong - Carlisle - Hammond.

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

a) Awaiting shop drawings. Require outline dimension for valve, operator details, electrical requirements, wiring diagrams, etc. Outline dimensions drawing submitted in Jan. '50

b) Control was eliminated in buying motor operators. NACA to advise whether local and remote control devices are to be furnished as part of the primary electrical contract. see Haas

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

After recent decision to use flow control on air mixing system two additional valves are required. Specification by Burns and Roe not yet started. — need Burns' date for spec.

Item 46 (Orifice and Metering Combustion Air)

Information complete. Drawing has been approved since Feb 17.

Item 47 (Expansion Joints - C. W. System)

Awaiting shop drawings from U. S. Rubber and Zallea Bros. Drawings approved, ✓ corrected drawing in process for approval

Item 48 (Expansion Joints - Combustion Air System)

a) Expansion joint specification sent to NACA for approval on February 6th. Release held until final combustion air piping system is decided upon. Spec. out for bid.

Item 49 (Pressure Gages, Therm. and Test Wells - 1st Step Construction)

No work being done.

Item 50 (Fire Protection - 1st Step)

a) Proposals submitted by Cardox Company showing separate systems for Shop and Access Building and High Pressure Fuel Pump House.

b) NACA (Mr. Lehr) is considering a system to combine Equipment Building with location of combined tanks adjacent to 13' diameter gas header duct.

c) Burns and Roe reviewing details with NY representative of Cardox.

d) It is our understanding that NACA after reviewing all systems with Mr. ~~Rogers~~ Davis (~~Chicago~~ Cleveland representative) will submit a diagram and explanatory information.

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

a) Final drawings are being made for foundations for compressors and first stage exhauster.

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

1. Secondary stage exhauster.
2. Starting M-G set, slip regulators, etc.
3. Expander turbine.
4. Electrical switchgear, misc. control panels and exciters.
5. Refrigeration and air drying equipment.
6. Transformers and induction regulators.
7. Gas fired air heaters.

c) Final Architectural and Structural drawings are progressing based on decisions as agreed upon and recorded in Conference Notes No. 39 dated 3/7/50.

d) The following additional information is required from NACA.

1. Final official approval of building exteriors.
2. Absorption coefficient of sound absorption panels for use in the exhaust stacks and air intake stacks. These are panels which NACA have on hand.
3. Heating and ventilating studies indicate that a suitable system embodies forced supply into the basement area - through openings in the operating floor to individual ventilators through the roof. This is not in accordance with NACA specification but we understand is satisfactory.

e) Low intake stacks at the north end of the building with throwaway type filters are contemplated.

f) Preliminary study of general arrangement of control room will be made and suggestions submitted.

g) It is contemplated that single contract will include building substructure, superstructure, building steel and equipment foundations.

h) Drawings are in progress showing new "T" type manhole #86, new power duct bank and new telephone duct bank associated with this building contract.

SECTION II

The following items contain drawing lists of the work which requires completion within the May 1st deadline. The grouping of drawings within the contracts listed is substantially complete except for reference drawings. A careful study is being made on these drawings which will be added in the next Progress Report issue.

You will note that progress against all drawings is not shown. In some cases the work has not been started other than preliminary study, while in other cases considerable work may have been done in sketch form but is not truly reflected upon the progress of the particular drawing.

LIST OF CONTRACT DESIGN DRAWINGS

ITEM 29 - COMBUSTION AIR PIPING (1st Step)

Mechanical		No. 30	No. 31 & 32
CE-104503 (2310)	Combustion Air Piping Headers to Test Chambers - Plans, Elevations and Details	85%	90%
CE-104506 (2313)	Combustion Air Piping - Supports, Anchors and Miscellaneous Details	75	90
Reference Drawings			
CE-104511 (2318)	Combustion Air Piping Arrangement of Control Valves & Supports at Test Chambers	0	10
CE-104501 (2301)	Air and Gas Piping First & Second Step Gen. Arrangement Plan	78	80
CE-104502 (2302)	Air and Gas Piping First & Second Step Gen. Arrangement Elev.	78	80
CE-104507 (2314)	Air and Gas Piping First and Second Step Expansion Joint List	50	50
CE-104508 (2315)	Air and Gas Piping First & Second Step Valve List	30	30
CE-104551 (3302)	Air and Gas Piping Grounding System - Plant Details	100	100

		No. 29	No. 30
CE-104500 (2303)	Flow Diagrams - Air and Gas Piping Steel 1 and 2	92%	93%
CE-104501 (2301)	Gen. Arrg't. - Plan Step 1 & 2	76	7
CE-104502 (2302)	Gen. Arrg't. - Elev. Step 1 & 2	71	
CE-104503 (2310)	Combustion Air Piping - Plan, Elev. and Details - Altitude Test Chamber First Step (Revised drawing)	75	85
CE-104506 (2313)	Combustion Air Piping - Supports Anchors and Misc. Details - 1st (revised drawing)	25	75
CE-104507 (2314)	Exp. Joint List - Air & Gas Piping	45	50
CE-104508 (2315)	Valve List - Air & Gas Piping	28	30
CE-104509 (2316)	Control Piping, Plans, Elev. & Details, Step 1 and 2	0	0
CE-104510 (2317)	Control Piping, Sections and Details - Step 1 and 2	0	0
CE-104511 (2318)	Combustion Air Piping - Arrangement of Control Valves - First Step	0	0
CE-104512 (2319)	Combustion Air Piping - Details of Supports at Control Valves	0	0

b) Exhaust Gas Ducts (CE-104525 to CE-104539)

1. NACA requested Zallea Brothers to quote on adding T stiffener rings to spool of expansion joints and R. L. Carter Company to deduct for same. Now await final decision on this before correcting drawings. (See B&R letter dated Feb. 1)
B&R have corrected drawings and NACA sent them out for quotation 3/10/50

2. Preliminary information received on Exhaust System Control valves. Final drawings needed to adjust duct work drawings and to complete foundation drawings.

3. Shop drawings received from R. L. Carter Company. Return being held up for expansion joint and control valve information. Drawing have been approved B&R and NACA and returned to R. Carter & B&R 3/7/50. No further action required.

4. Contract for Exhaust Stack, Pump House, Tank Foundations, Pipe Supports, etc. (drawings CE-104525 and CE-104526 from this group plus others) awarded R. Hansen Company (NAw-5851). Minor revisions were made to these drawings due to relocation of orifice run and preliminary information on control valves.

c) Structural Steel and Concrete Design (CE-104540 to CE-104549)

1. Require final drawings on control valves for support design.

2. Stairways to walkways over Primary Coolers and Altitude Test Chambers being revised to suit platforms over combustion air line for transformers and Cardox unit.

3. New drawing (CE-104546) will include platforms, access, etc. to explosion discs on exhaust gas ducts and secondary coolers and to exhaust control valves as required.

4. Contract for Exhaust Stack, Pump Houses, Tank Foundations, Pipe Supports, etc. (drawings CE-104543, CE-104544, and CE-104545 from this group plus others) awarded to R. Hansen Company (NAw-5851). Drawing CE-104543 (Trench for Air Headers) is being redrawn occasioned by rerouting of orifice run and use of hinged expansion joint on air pipes which deepened trench and eliminated pressure thrusts. New drawing is 50% complete. Proposed Change Order will be sent to NACA during week of February 6th. (NACA have suggested a further major change)

5. Final location of connecting pipe to air heaters may necessitate minor changes to drawing CE-104543.

		No. 29	No. 30
CE-104540 (4310)	Walkways and Stairways - Test Chamber and Primary Coolers, Elevations and Sections	95%	95%
CE-104541 (4311)	Walkways and Stairways - Test Chamber and Primary Coolers - Sections & Details	95	95
CE-104546 (4318)	Misc. Walkways, Platforms, Ladders, etc.	9	5

d) Electrical (CE-104550 to CE-104557)

*CE-104550 (3301)	Outdoor Area Lighting & Receptacles Plans and Details	98	100
*CE-104551 (3302)	Grounding System - Plans & Details	97	100
CE-104552 (3303)	Instrumentation and Controls - Plans and Details	0	0

* These drawings have been revised to show the relocation of air piping outside the Shop and Access Building. The drawings will be included in the General Electrical Contract (1st Step).

V - COOLING TOWER & CIRCULATING WATER SYSTEM (CE-104558 to CE-104609)

a) Mechanical (CE-104558 to CE-104609)

1. Final specification revisions forwarded January 31, 1950.

2. Diffuser piping being revised in accordance with Burns and Roe letter dated 12/20/50.

3. Sepia tracings of piping drawings will be forwarded to NACA February 14, 1950. Checking has required more time than originally contemplated due to numerous piping changes which have been required by design changes, etc.

4. Drawings indicated as 97% have been checked, and corrected and must be back-checked.

		No. 29	No. 30
CE-104558 (2401)	Flow Sheet and Valve List		
CE-104559 (2402)	Location & Arrangement Plan	95%	97%
	Pump House Area	95%	97%
CE-104560 (2403)	Location & Arrangement Plan Equipment Area	95	97
CE-104561 (2404)	Pump House Piping - Plan, Sections and Details	95	97
CE-104562 (2405)	Details of Piping at Primary and Secondary Coolers	95	97
CE-104563 (2406)	Details of Piping at Altitude Chamber	95	95
CE-104570 (2407)	Heating, Vent. & Details	100	100

b) Structural Steel and Concrete (CE-104575 5o CE-104594)

1. Contract for Exhaust Stack, Pump Houses, etc. (Drawing CE-104576, CE-104577, CE-104579, CE-104580 and CE-104581 in this group plus others) awarded R. Hansen Company (NAw-5851).

2. Minor revision showing manhole and catchbasin details being made to drawing CE-104583.

		No. 29	No. 30
CE-104583 (4406)	C. W. Pipe Supports & Manholes	95%	95%
CE-104584 (4408)	Steam Trecnh Extension Along Walcott and Westover Roads	80	95

c) Electrical (CE-104594 to CE-104609)

Sepia tracing of drawing SK-1218-E-13-1 "Control Diagram for Manual-Automatic Operation" sent to NACA. This diagram covers changes and additions to be included in an Amendment to Specification No. C-1175. NACA advised verbally that they have certain changes. This will be discussed during Conference the week of February 6, 1950.

		No. 29	No. 30
CE-104594 (3401)	CW Pump House Lighting		
(Gen. Bldg. Cont.	Grounding & Concealed Conduit Plan	100	100
*CE-104594 (3402)	C.W. Pump House - One Line Diagram Switchgear & Transf. Arrangement Plan	93	95
*CE-104596 (3403)	C.W. Pump House - Equipment Grounding Conduit Plans and Details	75	80
*CE-104597 (3404)	Cooling Tower - Lighting Plan & Details	100	100
*CE-104598 (3405)	Cooling Tower - Conduit and Grounding Plans and Details	100	100
*CE-104599 (3406)	Power Ducts and Manhole Details	98	100
*CE-104600 (3407)	Substation "C" Arrangement Plan and Details	100	100
*CE-104601 (3408)	One Line Diagram - 1st Step Operation Phase I -	50	75

*These drawings will be included in General Electrical Contract.

In connection with drawing CE-104594 the switchgear arrangement proposed by Westinghouse as part of their bid proposal on the dimensional outline drawing does not conform to Burns and Roe suggested arrangement as covered in specification C-1175, drawing SK-1218-E-2. Rearrangement of switchgear is in progress and will be discussed with NACA during Conference of February 6, 1950.

It should be noted that a study is in progress to accommodate an estimated additional load of 250 hp for pumps and 50 hp for auxiliaries for water treatment.

This additional load will require a new transformer and switchgear. This additional equipment will be discussed with NACA during Conference of February 6, 1950.

VI - FUEL STORAGE AND DISTRIBUTION SYSTEM (CE-104610 to CE-104669)

a) Mechanical (CE-104610 to CE-104630)

1. Drawings indicated with an asterisk (*) are ready for checking. Checking started February 1, 1950.

2. These drawings will be ready for final issue about March 1st, 1950 as a Low Pressure Fuel Piping Contract.

3. Remaining Fuel Piping drawings (High Pressure Pumphouse and Altitude Chamber) will be ready about the same time or shortly thereafter. It seems advisable to issue all drawings at the same time under a single specification which will provide a unified contract responsibility and less coordination.

4. Drawing #CE-104617 "Fuel Piping - High Pressure Pumphouse Sections" has been added to drawing list to permit sufficient detail of piping and to provide room for metering as required.

5. Draft of Fuel Piping Specification will be forwarded to NACA February 10, 1950 together with approval prints of drawings indicated with an asterisk (*).

		No. 29	No. 30
*CE-104610	(2501) Flow Sheet HP & LP Systems	80%	85%
*CE-104611	(2502) Location & Arrangement Plan Storage & LP PH Area	95	95
*CE-104612	(2503) Location & Arrangement Plan Altitude Chamber & HP PH Area	95	95
*CE-104613	(2504) Details of Piping in LP PH	95	95
CE-104614	(2505) Fuel Piping - HP PH - Plans	80	80
CE-104615	(2506) Details of Piping At Altitude Chamber	60	65
*CE-104616	(2507) Valve List	20	40
CE-104617	(2508) Fuel Piping HP PH - Sections	0	0
CE-104619	(2510) LP PH - Heating, Vent & Details	100	100
CE-104620	(2511) HP PH - Heating, Vent. & Details	0	10
CE-104622	(2513) Fire Protection System (CO2)	0	0
	(2514) Fire Protection System (CO2)	0	0

b) Structural Steel and Concrete (CE-104631 to CE-104654)

1. Preliminary sketch of high pressure pump house sent to NACA for approval. Awaiting comments before completing design. (Received February 3rd).

2. Contract for Exhaust Stack, Pump Houses, Tank Foundations, Pipe Supports, etc. (Drawing CE-104640, CE-104641 and CE-104642 in this group plus others) awarded R. Hansen Company (NAw-5851).

NACA No.	B&R No.	Title	No. 29	No. 30
	(4504)	Pump Floor and Metering Floor	-	5%
	(4505)	Elevations	-	5%
	(4506)	Typical Wall, Window, Door & Stair Details	-	5
	(4507)	Roof Plan, Plot Plan, Plumbing & Finish Schedules	-	5
	(4510)	Piling Plan, Foundations, Pump Floor & Details	-	0
	(4511)	Framing, Plans - Metering Floor, Roof, Column Schedule & Details	-	0
	(4512)	Elevations & Details	-	0

c) Electrical

Hansen Contract (NAw-5851)

CE-104655 (Gen. Bldg. Cont.)	(3501)	LP Fuel Pump House - Lighting, Grounding & Concealed Plan	100%	100%

General Electrical Contract

CE-104656	(3502)	LP Fuel Pump House - Equipment Grounding, Conduit Plan & Details	75	77
CE-104657	(3503)	Fuel Storage Area - Outdoor Lighting and Conduit Plan	100	100
CE-104660	(3506)	Telephone & Intercommunication Ducts and Manhole Details	35	75

HP Fuel Pumphouse Contract

CE-104658	(3504)	HP Fuel Pumphouse - Lighting and Details	0	0
CE-104659	(3505)	HP Fuel Pumphouse - Equipment Grounding, Conduit Plan and Details	0	0

VII - ELECTRICAL SUBSTATIONS - (CE-102374 to CE-102383)
(CE-102388 to CE-102407)

a) Electrical

3601 - Substation "A" Wiring Diagrams - Control, Relaying and Alarms
3602 - Substation "B" Arrangement Plan including Grounding and One Line Diagram
3603 - Substation "B" Elevs. and Sections - Bays 1,2,6, & 7
3604 - Substation "B" Wiring Diagrams - Control, Relaying and Alarms
3605 - Substation "G" Arrangement Plan, including Lighting and Grounding - One Line Diagram
3606 - Substation "G" Elevations and Sections (Existing and New Bays)
3607 - Substation "G" Cable (34.5KV) Routing - Cable Vault
3608 - Substation "G" Wiring Diagrams - Control, Relaying and Alarms
3609 - Substation "G" Conduit Plan
3610 - Underground Ductlines (34.5KV) and Manholes - 2nd Step Operation

b) Structural

4601 Substation "B" Reactor Foundations and Manholes
4602 Substation "G" Framing Plan and Details - New Bay

VIII - EQUIPMENT BUILDING

1. Proposals for gas fired air heaters received and comments returned 1/24/50. Awaiting award and certified prints to start design. Air piping design being delayed.

2. Requirements for the drying and refrigeration system have been decided. Preliminary discussion with two vendors have been held. A letter has been issued to York, Carrier and Magher as a basis for vendor's preparation for Conference discussion.

3. Require certified prints for Second Stage Exhausters from Roots Connersville.

4. Specifications for expansion joints for duct work and piping in Equipment Building will be started as soon as possible.

5. Information on low pressure butterfly valves for exhausters have been received from vendors. Specifications for same will be started as soon as possible.

6. Study being made on Central Lubrication System in Equipment Building.

7. Study being made of Ventilating System for Equipment Building.

8. Study will be started on Circulating Water System in Equipment Building as soon as possible.

9. Study being made for CO_2 fire protection system for Equipment Building.

The following list of drawings have been tentatively scheduled as necessary for the mechanical work. These drawings are being divided into Contract groups by the Design Department.

B&R Dwg. #	NACA No.	Title (CE-104700 to CE-104799)	No. 30
2701		Operating Floor Plan	10%
2702		Basement Floor Plan	10
2703		Mezzanine Floor Plans	0
2704		Cross Sections (2)	10
2705		Cross Sections (2)	0
2706		Longitudinal Sections (2)	5
2707		Longitudinal Sections (2)	0
2708	Note: Will be made by Structural Dept.	(Exh. Duct - Sec. Coolers to Equip. Bldg.	
2709		(Exh. Ducts - 1st Stage Exhauster	
2710		(Exh. Ducts - 1st Stage Exhauster	
2711		(Exh. Ducts - Second Stage Exhauster	
2712		(Exh. Ducts - Second Stage Exhauster	
2713		(Exh. Ducts - Second Stage Exhauster	
2714		(Exh. Ducts - Second Stage Exhauster	
2715		Exhauster Bleed Piping	
2716		Combustion Air Piping - Intake & 1st Stage Comp.	
2717		Combustion Air Piping - 2nd Stage Compressor	
2718		Combustion Air Piping - 2nd Stage to Header & Air Heaters	
2719		Comb. Air Piping - Aftercoolers to Refrigeration System	No Progress
2720		Comb. Air Piping - Refrigeration System to Expansion Turbine	"
2721		Combustion Air Piping - Expansion Turbine to Header	"
2722		Combustion Air Piping - Details	"
2723		Gen. Arrg't Plan of Refrigeration and Drying System	"
2724		Gen. Arrg't Elevation of Refrigeration and Drying System	"
2725			
2726		C. W. Piping - Plan	"
2727		C. W. Piping - Elevations	"
2728		C. W. Piping - Elevations	"
2729		C. W. Piping - Elevations	"
2730		C. W. Piping - Details	"
2731		C. W. Piping - Details	"
2732		Utility Compressed Air Piping	"
2733		Utility Compressed Air Piping	"
2734		Central Lubrication System - Plans	"
2735		Central Lubrication System - Elevations	"
2736		Central Lubrication System - Sections	"
2737		Central Lubrication System - Details	"

B&R Dwg. #	NACA No.	Title	No. 30
2738		Instrument Lists	No Progress
2739		Instrument Lists	"
2740		Instrument Piping Plan	"
2741		Instrument Piping Details	"
2742		Control Panels - First Stage Exhausters	"
2743		Control Panels - Second Stage Exhausters	"
2744		Control Panels - Compressors	"
2745		Control Air Piping Plan	"
2746		Control Air Piping Details	"
2747		Hydraulic Valve Oil Piping - Plan	"
2748		Hydraulic Valve Oil Piping - Details	"
2749		Intercooler Drain Piping	"
2750		Heating and Ventilating System	"
2751		Heating and Ventilating System	"
2752		Heating and Ventilating System	"
2753		Heating and Ventilating System	
2754		Control Room - Air Conditioning System	"
2755		Control Room - Air Conditioning System	"
2756		Floor Openings	

b) Structural and Architectural

1. Elevation drawings showing an exterior composed of Q-panels with horizontal run of fluted section, brick, glass block and windows in rear only sent to NACA. Has been discussed by telephone. Now awaiting formal comments.

2. Letter and Laboratory report on sound transmission qualities of perforated Q-Paneling sent to NACA. Awaiting comments (Letter dated January 30, 1950).

3. Design of building is progressing based on basic dimensions and grades as stated in Burns and Roe letter dated January 24, 1950.

4. Final drawings are being made of foundations for compressors and first stage exhausters.

5. A tentative drawing list for building and foundations has been made as follows:

Architectural

NACA No.	B&R No.	Title
	(4701)	Plot Plan
	(4702)	Basement Plan
	(4703)	Operating Floor Plan
	(4704)	Roof Plan

NACA No.	B&R No.	Title
	(4705)	Mezzanine Plan and Sections - Control Room
	(4706)	Mezzanine Plan and Sections - Elec. Mez.
	(4707)	Control Room Details
	(4708)	North Elevation
	(4709)	South Elevation
	(4710)	East Elevation
	(4711)	West Elevation
	(4712)	Transverse Section
	(4713)	Longitudinal Section
	(4714)	Typical Wall & Window Details - Sheet 1
	(4715)	Typical Wall & Window Details - Sheet 2
	(4716)	Typical and Special Door Details
	(4717)	Entrance Details
	(4718)	Toilet and Locker Room Details
	(4719)	Stair & Railing Details - Plans - Sheet 1
	(4720)	Stair & Railing Details - Plans - Sheet 2
	(4721)	Misc. & Special Details - Sheet 1
	(4722)	Misc. & Special Details - Sheet 2
	(4723)	Cold & Hot Water Piping - Plan
	(4724)	Cold & Hot Water Piping - Section
	(4725)	Sanitary & Storm Sewer Piping - Plan
	(4726)	Sanitary & Storm Sewer Piping - Section
	(4727)	Schedules, Windows, Doors, Hardware, Finish
		Sturctural (Superstructure)
	(4731)	Roof Framing Plan
	(4732)	Roof Truss
	(4733)	Control Room Mezzanine Framing Plan
	(4734)	Electrical Mezzanine Framing Plan
	(4735)	Operating Floor Framing Plan
	(4736)	Col. Sched. & Crane Girder Details
	(4737)	Col. Line Elevations - East & West Walls
	(4738)	Col. Line Elevations - North & South Walls
		Structural (Substructure and Foundations)
	(4746)	Building Foundation Plan
	(4747)	Basement Floor Plan
	(4748)	Concrete Enclosure for Intake & Exhaust Pipes
	(4749)	Compressor Foundation - Sheet 1
	(4750)	Compressor Foundation - Sheet 2
	(4751)	1st Stage Exhauster Foundation
	(4752)	2nd Stage Exhauster Foundation - Sheet 1
	(4753)	2nd Stage Exhauster Foundation - Sheet 2
	(4754)	Motor Generator Set Foundation
	(4755)	Misc. Equipment Foundations
	(4756)	Air Heater Foundations
	(4757)	Transformer Foundations
	(4758)	Refrig. Equipment Foundation - Sheet 1
	(4759)	Refrig. Equipment Foundation - Sheet 2

c) Electrical

Study drawings showing running switchgear arrangement, main (13.8 KV)power and 2300 volt power transformers arrangement sent NACA 1-27-50. These arrangements are based upon one-line drawings received from NACA during Conferences 1-12 and 13-50.

No shop drawings have been received for the starting M-G exciter, although promised by Elliott for early submission. It was understood that the M-G exciter set was of Croker-Wheeler design and shop drawings were ready.

At the Conference 1-12 and 13-50 Elliott promised maximum outline dimensions for the slip regulator as received from various manufacturers. This information has not been received by Burns and Roe.

Electrical drawings

NACA No.	B&R No.	Title
	3701	Main One Line Diagram - Sheet 1
	3702	Main One Line Diagram - Sheet 2
	3703	Auxiliary One Line Diagram - Sheet 1
	3704	Auxiliary One Line Diagram Sheet 2
	3705	Interconnection Wiring Diagram - Sheet 1
	3706	Interconnection Wiring Diagram - Sheet 2
	3707	Annunciator Schematic Diagram
	3708	Wiring Diagram - Sheet 1
	3709	Wiring Diagram - Sheet 2
	3710	Wiring Diagram - Sheet 3
	3711	Wiring Diagram - Sheet 4
	3712	Wiring Diagram - Sheet 5
	3713	Wiring Diagram - Sheet 6
	3714	Lighting Plan - Basement Floor
	3715	Lighting Plan - Basement Mezzanine
	3716	Lighting Details - Basement Floor & Mezzanine
	3717	Lighting Plan - Operating Floor
	3718	Lighting Plan - Control Room & Utility Mezzanine
	3719	Lighting Details - Operating Floor and Mezzanine
	3720	(See Below *)
	3721	Arrangement Plan - Basement Mezzanine
	3722	Arrangement Plan - Operating Floor
	3723	Arrangement Plan - Elec. Bay - Operating Floor
	3724	Arrangement Plan - Control Room
	3725	Arrangement Plan - Substation "J"
	3726	Elevations & Sections - Substation "J"
	3727	Elevations & Sections - Electrical Bay
	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

NACA No.	B&R No.	Title
	3734	Conduit Details - Sheet 2
	3735	Conduit Details - Sheet 3
	3736	Grounding Plan - Inc. Subs. "J" & Gas Fired Air Htrs.
	3737	(See Below**)
	3738	Underground Ductlines and Manhole Details
	3739	13.8 KV Motor Leads - Details - Sheet 1
	3740	13.8 KV Motor Leads - Details - Sheet 2
	3741	Telephone & Signal System - Basement Floor
	3742	Telephone & Signal System - Operating Floor
	3743	Telephone & Signal System - Elevations & Details
	3744	Telephone & Signal System - Underground Services
	3745	Riser Diagrams & Schedules - Sheet 1
	3746	Riser Diagrams & Schedules - Sheet 2
	3747 to 3750	Unassigned

* Lighting Plans and Details - Substation "J" and Gas Fired Air Heaters.

** Grounding Details - Including Substation "J" and Gas Fired Air Heaters.

Progress

Based on the status of the work as of February 1st, 1950 we believe that the following percentages may be considered as resonably accurate for engineering and design completion.

	No. 28	No. 30
1. Operations Building	99%	99%
Amendment #1	99	99
Amendment #2	100	100
2. Altitude Test Chambers	98	98
3. Shop and Access Building	97	98
4. Test Air Piping	88	92
Amendment #3	0	90
5. Cooling Tower & Circulating Water Sys.	90	93
6. Fuel Storage and Distribution System	85	88
7. Electrical Substations	15	18
8. Equipment Building and Equipment	18	23

DRMcConathy/RDK/KBH/WGC/LHR/id

DRMcConathy/id

Mr. O ~~Organ~~
W.K. Fox
w/ Nelson

Ret. 29659 to ~~Organ~~ PSL when finished, or give comments to them.

BURNS AND ROE, INC.
ENGINEERING CONSULTANTS
233 BROADWAY
NEW YORK 7, N. Y.
TEL. BARCLAY 7-5900

Subject: National Advisory Committee for Aeronautics
Propulsion Science Laboratory - Phase I Part II
Project No. 794 (NAw-5652) - B&R W.O. #1218
Transmittal of Progress Reports No. 31 and 32

March 10, 1950

Representative of the Contracting Officer
National Advisory Committee for Aeronautics
Flight Propulsion Research Laboratory
Cleveland Airport, Cleveland, Ohio

Attention: Mr. E. Wasielewski

Gentlemen:

We are transmitting herewith four (4) copies of combined Progress Reports No. 31 and 32 - Sections I and II for your information and files.

Please note that the Progress Report has been prepared along with the general system used in our contract schedule. In Section I we have endeavored to point out information lacking from both NACA and the manufacturers furnishing equipment. This information is very important to the progress and our engineering and design and we suggest that you make every effort to attain same.

Section II of this report has been devoted to the listing of contract drawing lists as now foreseen. These lists are being more completely combed by our design groups in an effort to eliminate and drawings possible and to include reference drawings. As in the past, the exact titles will necessarily be revised as the need demands.

You will note that drawing lists for the Circulating Water Piping and the Fuel Piping Systems have not been listed since this work is assumed to be relatively complete.

In addition to the drawings listed in Section II there are some miscellaneious drawings such as valve lists, expansion joint lists, panel board details, flow diagrams, etc. which will be developed for informational purposes and will probably be established in certain contracts as reference drawings.

Yours very tr

DRMcConathy/id
Encls.
cc: Mr. E. J. Tempest

Copy to
J.K. Braig
C.A. Neumann
Area Files

Orig & 2 Cop
rept to
PSL -

PROGRESS REPORTS NO. 31 AND 32

29659

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

March 7, 1950

cc: NACA-4
EJT

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

SECTION I

This Progress Report which covers the month of February, 1950 is being revised in form to coincide with Contract Schedule tabulations dated February 24, 1950. Item Numbers referred to herein are the same as shown on Contract Schedule. See following Section for Drawing Lists.

SECTION I

Item 1 (25,000 KVA Power Transformers)

a) General location and arrangement of transformers established and approved. Question of protection walls not satisfactorily settled.

b) Awaiting manufacturers' drawings showing outline of transformers, nameplate data and wiring diagrams before design of cable vault and foundations can proceed.

Item 2 (Primary and Secondary Coolers)

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

b) Final drawings on primary coolers showing revised water connections have not been received.

Item 3 (Exhauster System With Motors)

a) Require certified drawings from Roots Connersville for second stage exhausters. We understand that the mechanical brake has been agreed upon.

b) What decision has been made as to motors operating on synchronous condensers. This question also applies to Item #4.

c) Please request Roots Connersville to tabulate..... as (a) below for Exhausters.

Item 4 (Compressor System With Motors)

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

Item 5 (Cooling Tower)

Complete.

Item 6 (Interconnecting Tie Line - Foundation)

Complete.

Item 7 (Interconnecting Tie Line - Foundation)

Complete.

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

a) Require test curves for pumps in order to determine final control scheme for both 700 and 150 hp pumps. Comments and suggestions in your letter of February 6th being held up until curves received.

b) No information has been received as yet as to final location of bearing temperature relays for pumps.

Item 9 (Structural Steel - Operations and Shop and Access Bldgs.)

Complete - Drawings finished.

Item 10 (Extension of 2400-V Pole Line)

Complete.

Item 10A (Line Relocation)

No Comment.

Item 11 (Pressure Control Stations)

a) Askania to furnish the following information as soon as possible.

1. Flow diagrams - hydraulic.
2. Wiring diagrams - electrical.
3. Pump drawings.
4. Regulator drawings.
5. Tank drawings.

The above was promised at Cleveland Conference No. 36, dated February 7, 1950.

b) Henry Pratt furnished outline drawings showing arrangement and operation of cylinders for all combustion air control valves.

Item 12 (Two Sluice Gates and Mud Valves)

Complete.

Item 13 (Cooling Tower Basin and Foundation)

See Item #32 for change in cooling basin sump.

Item 14 (Altitude Test Chamber)

a) Proposed Change Order No. 16 issued February 10th.

b) Shop drawings being processed as received.

c) Your letter of February 23rd relative to alignment of shaft and locking level assembly answered.

Item 15 (Inter and After Coolers - Spec. Items #2 and #9)

a) Ross Heater have not furnished drawings of accessories.

b) A problem of anchoring compressor aftercoolers will have to be settled with Ross Heater in accordance with new lay-out of compressor piping as discussed with Mr. E. Wasielewski on February 21, 1950.

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

a) Require drawings from Griscom Russell on the following:

1. Final certified drawings for all coolers.
2. Certified drawings of drain pumps, motors and accessories.

b) The problem of anchoring compressor intercooler will have to be taken up with Griscom Russell. This was discussed with Mr. E. Wasielewski in New York on February 21, 1950.

Item 17 (Operations Building) - Drawings Complete.

a) Proposed Change Order No. 18 issued on February 17, 1950.

b) Most shop drawings have been received.

c) Revised shop drawings have not been received on the switchgear and transformers, lighting and telephone circuiting.

d) Awaiting information from NACA as to the status of switching for corridor lights.

Item 18 (Shop and Access Building) - Drawings Complete.

a) Proposed Change Order No. 15 issued on February 10.

b) Proposed Change Order No. 17 issued on February 17.

c) These change orders provide the necessary information for Emerson to continue construction. This completes changes necessitated by the relocation of the orifice run.

d) The Cardox system is being restudied relative to locating tanks adjacent to 13' diameter exhaust header. We understand that Mr. Lehr is working up a sketch with Mr. Rogers, the Chicago representative of the Cardox Company.

e) Require shop drawings for control cubicle-outline and wiring diagrams.

Item 19 (Fuel Storage Tanks)

All shop drawings complete except some accessory drawings have not been returned in corrected form.

b) Starting proposal drawing covering installation of anodes for cathodic protection which are to be installed for the underground fuel storage tanks. This will require Change Order to the Hammond contract.

Item 20 (Telephone Addition)

No comment.

Item 21 (Exh. Gas Duct Expansion Joints)

Revised drawings received from Zallea Brothers February 27, 1950.

Item 22 (Fuel Filters)

Final drawings received and returned.

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

Shop drawings are being processed.

Item 23A. (Substation "C" Switchgear)

Shop drawings are being processed.

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

a) Bid analysis tabulation received. Awaiting N.A.C.A. decision as to award.

b) Shop drawings required as soon as possible for design information.

Item 24 (Gas Fired Air Heaters)

a) Layout of air heaters and piping is being made on the basis of proposal drawings using Petro Chemical vertical heaters for bottom air inlet and top outlet.

b) Burns and Roe are establishing location of inlet and outlet flanges. Will advise.

c) NACA to obtain certified drawings from vendors before final drawings of piping and foundations can be made.

d) Please request Petro Chemical to furnish list of accessories including wiring diagrams, controls, panel boards, electrical requirements, etc. immediately.

Item 25 (Exhaust Gas Duct System)

a) Drawings being revised to accommodate Zallea Brothers revised expansion joints and exhaust gas control valves and combustion air by-pass as determined. Looking drawings on valves - Item #11.

b) Carter drawings showing general arrangement will be returned when above work is complete. Expect to return Carter drawings March 3rd.

Item 26 (Two 48" Motor Operated Gate Valves)

a) Awaiting shop drawings. Require outline dimensions for valve, operator details, electrical requirements, wiring diagrams, etc.

b) Control was eliminated in buying motor operators. NACA please advise whether local and remote control devices are to be furnished as part of the primary electrical contract.

Item 27 (Variable Frequency Starting and Exciting Equipment)

a) The following shop drawings are required.

1. Outline drawings showing foundation requirements, etc. for the variable frequency motor generator.
2. Motor generator exciter. - Same information.
3. Outline dimensions for slip regulator listed in your letter of February 24, 1950.
4. List of auxiliaries and hp requirements associated with slip regulator required.
5. Wiring diagram of associated auxiliaries.

b) The receipt of the above shop drawings will permit Burns and Roe to establish equipment layout and arrangement for the northwest corner of the Equipment Building.

Item 28 (Safety Discs and Diaphragms)

Complete.

Item 29 (Combustion Air Piping System)

a) At Conference No. 36 in Cleveland on February 7th, NACA requested further changes in combustion air piping. This required revisions to drawings CE-104503, 506 which were issued to NACA for approval on February 3rd.

b) A study drawing is now being made of the new arrangement along the lines discussed, and revised drawings will be issued for final approval about March 10th. If these drawings are satisfactory, release to vendors may be made.

c) All changes necessitated by relocation of the orifice outside of the Shop and Access Building have not been made.

Item 30 (Circulating Water Piping System)

Final drawings and specifications sent to NACA on Feb. 17th.

Item 31 (Fuel Piping System)

a) Approval drawings and specifications being reviewed by NACA. Burns and Roe awiating comments before final issue.

b) Drawings being finally checked. (March 15th intended date of final sepia release to NACA).

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

a) Addition of water treatment Equipment Building to C.W. pump house being made. Concrete duct from cooling tower being eliminated. Change Order to Hansen will be issued for change in Contract NAW-5851. Revision for booster pump pit at basin to follow later.

b) Trench for combustion air headers will be revised when status discussed under Item 29 is complete.

Item 32A. (HP Fuel Pump House)

Design drawings for the HP Fuel Pump House are approximately 50% complete. Design progressing satisfactorily.

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

Final specifications and drawings will be sent to NACA during the week of March 6th.

Item 34 (Combustion Air Heater Piping)

Work included under Item 54.

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

a) Drawings sent to NACA for final approval on February 27th except for access platforms to exhaust gas control valves.

b) Specification is being prepared.

Item 36 (Thermal Insulation (1st Step Construction)

No work being done.

Item 37 (Thrust Platform Mechanical)

a) Drawing being revised to agree with last NACA comments. Sepia will be issued to NACA by March 3rd.

b) Final specifications are being prepared by NACA from Burns and Roe's draft.

Item 38 (Panel Boards - Shop and Access Building)

Work cannot proceed until full information is available on control systems.

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

Cannot proceed until more specific information is available.

Item 40A,B,C,D, and E (Water Treatment System)

a) Burns and Roe working with Sheppard T. Powell in determining design information for softening system and vacuum deaeration system.

b) Information on vacuum pumps and booster pumps available from NACA stock to be forwarded to Burns and Roe.

c) No decision has been made as to the amount of steam available for steam ejectors on vacuum deaerators if steam ejection is to be considered.

d) Preliminary studies and arrangements being made for entire system.

Item 41 (7" Dia. Air Line Installation)

Air headers required for the Shop and Access Building and Primary Cooler areas have been included in the circulating water piping contract. Additional air distribution headers for Shop and Access Building and other equipment in the area and to the Equipment Building will be included in either service piping contract for the Equipment Building or control and instrumentation piping.

Item 42 (Fuel Metering Equipment)

NACA preparing specification for purchase.

Item 43 (Fuel Pressure Control System)

Specification issued awaiting bids.

Item 44 (HP and LP Fuel Pumps)

All design drawing information received. Additional shop drawings required.

Item 44A. (Gasoline Drainage Pumps)

Awaiting award of bid and shop drawings.

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

a) Awaiting shop drawings. Require outline dimension for valve, operator details, electrical requirements, wiring diagrams, etc.

b) Control was eliminated in buying motor operators. NACA to advise whether local and remote control devices are to be furnished as part of the primary electrical contract.

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

After recent decision to use flow control on air mixing system two additional valves are required. Specification by Burns and Roe not yet started.

Item 46 (Orifice and Metering Combustion Air)

Information complete.

Item 47 (Expansion Joints - C. W. System)

Awaiting shop drawings from U. S. Rubber and Zallea Bros.

Item 48 (Expansion Joints - Combustion Air System)

a) Expansion joint specification sent to NACA for approval on February 6th. Release held until final combustion air piping system is decided upon.

Item 49 (Pressure Gages, Therm. and Test Wells - 1st Step Construction)

No work being done.

Item 50 (Fire Protection - 1st Step)

a) Proposals submitted by Cardox Company showing separate systems for Shop and Access Building and High Pressure Fuel Pump House.

b) NACA (Mr. Lehr) is considering a system to combine Equipment Building with location of combined tanks adjacent to 13' diameter gas header duct.

c) Burns and Roe reviewing details with NY representative of Cardox.

d) It is our understanding that NACA after reviewing all systems with Mr. Rogers (Chicago representative) will submit a diagram and explanatory information.

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

a) Final drawings are being made for foundations for compressors and first stage exhauster.

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

1. Secondary stage exhauster.
2. Starting M-G set, slip regulators, etc.
3. Expander turbine.
4. Electrical switchgear, misc. control panels and exciters.
5. Refrigeration and air drying equipment.
6. Transformers and induction regulators.
7. Gas fired air heaters.

c) Final Architectural and Structural drawings are progressing based on decisions as agreed upon and recorded in Conference Notes No. 39 dated 3/7/50.

d) The following additional information is required from NACA.

1. Final official approval of building exteriors.
2. Absorption coefficient of sound absorption panels for use in the exhaust stacks and air intake stacks. These are panels which NACA have on hand.
3. Heating and ventilating studies indicate that a suitable system embodies forced supply into the basement area - through openings in the operating floor to individual ventilators through the roof. This is not in accordance with NACA specification but we understand is satisfactory.

e) Low intake stacks at the north end of the building with throwaway type filters are contemplated.

f) Preliminary study of general arrangement of control room will be made and suggestions submitted.

g) It is contemplated that single contract will include building substructure, superstructure, building steel and equipment foundations.

h) Drawings are in progress showing new "T" type manhole #86, new power duct bank and new telephone duct bank associated with this building contract.

Item 53 (Primary Electrical Work - Equipment Building Area)

a) Preliminary study drawings showing locations and motor control center unit, substation and exciter sent to NACA on February 28th.

b) Connections between main transformer and starting switchgear will consist of cable rather than bus duct.

c) Study drawings covering connections between switchgear and main motors in progress.

d) Drawings covering building lighting in progress.

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

a) Layouts showing arrangement of the expansion joints and anchor points have been completed for the compressors and first stage exhauster and preliminary arrangement has been developed for second stage exhauster.

BS

b) Final certified information on Griscom Russell coolers and second stage exhauster is delaying design of piping.

c) The air and gas piping will be arranged in such a way as to permit a tow truck passage of 8' high and 8' wide along both sidewalls of the basement area and through the center aisle. Free passage to the access door at the south end of the building will be maintained. It seems unnecessary and impractical to raise piping and coolers to permit transverse passage through the systems other than for personnel.

d) Piping from Equipment Building around air heaters and to headers is being developed. Burns and Roe will advise NACA most practical flange locations for air heaters.

e) Piping from air compressor aftercooler through refrigeration and drying system to expander turbine cannot be developed until information is available.

Item 55 (Gen. Serv. Piping Equipment Building Area) - Preliminary Study Only

Item 56 (Refrigeration Equipment and Piping)

a) Two refrigeration vendors have studied air cooling and drying with mechanical systems and estimated costs have been ascertained.

b) Chemical drying concerns have been contacted by NACA and Conference arranged in Cleveland for March 3rd.

c) The results of the March 3rd Conference are to then be compared with the mechanical refrigeration studies relative to costs and procedures decided upon.

Item 56A. (Expander Turbine)

a) NACA negotiating contract with Elliott Company for manufacture of expander turbine.

b) Shop drawing information required as soon as possible.

Item 57 (Thermal Insulation - 2nd Step Construction)

No work being done.

Item 58 (Compressor System - Controls)

Amendment #5 to Specification C-550 issued to Elliott for quotation. Burns and Roe awaiting results.

Item 59 (Exh. System - Controls)

Amendment #6 to Specification C-550 issued to Roots Connersville. Burns and Roe awaiting results.

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

Specifications are being prepared.

Items 61 and 62 - (Butterfly Valves - Exh. Gas System)
(Rubber Expansion Joints at Machines) — doubtful for some machines

Specifications are being prepared for these items and will be issued for NACA's approval as soon as possible.

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

Specifications will be prepared as soon as data is available.

Item 63 (Combustion Air System)

Specifications will be prepared as soon as data is available.

Item 65 (Lube Oil System)

a) Study of the L.O. System has been made on the basis of preliminary information received from both Roots Connersville and Elliott Company.

b) Burns and Roe have requested NACA to obtain from both vendors complete and final information on quantities and pressures of lubricating oil for both the exhausters and compressors and their driving motors. We must have this information before we can complete our study.

Item 66 (Building Cranes)

a) Specifications are being prepared based on using Cab operated cranes with provisions for a future transfer between bays.

Item 67 (Exh. and Compressor Control Panels)

Awaiting information from NACA on Items 58 and 59 to develop these panels.

Item 68 (Inst. Gages and Test Wells - 2nd Step)

No work being done.

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

a) Specification being prepared to cover unit substation and motor control center equipment.

b) Specification for motor control center equipment cannot be complete until details of various buildings and equipment auxiliaries have been decided upon as to hp requirements.

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

a) Awaiting opening of bids on this equipment.

b) It is important that outline drawings be obtained as quickly as possible from successful bidders in order to complete lay-out and arrangement of electrical bay and outdoor transformer substation.

Item 73 (34.5 KV Cable Installation)

Specification in progress to be forwarded week of March 13th.

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

a) No comments received to-date from NACA of preliminary study drawings showing arrangement of switchgear and new and existing bays at Substation "G". This will cause delay in the preparation of specification drawings for this equipment.

b) Preliminary drawing showing location of reactors in substation "B" discussed with NACA.

c) Relocation for final 7% at 48 MVA reactors will be included on specification drawings.

d) Specification in progress covering various switching and structure equipment required in substations "B" and "G".

Item 76 (Primary Electrical Work Substation Area)

Information not available.

Item 77 (Intercommunication System)

No progress.

Item 78 (Installation Contract - Misc. Mech. and Elec. Equipment)

No progress.

SECTION II - Progress of Contract Drawings will be forwarded in a day or two to be attached to this Progress Report.

DRMcConathy/KBH/LHR/RDK/id

SECTION II

The following items contain drawing lists of the work which requires completion within the May 1st deadline. The grouping of drawings within the contracts listed is substantially complete except for reference drawings. A careful study is being made on these drawings which will be added in the next Progress Report issue.

You will note that progress against all drawings is not shown. In some cases the work has not been started other than preliminary study, while in other cases considerable work may have been done in sketch form but is not truly reflected upon the progress of the particular drawing.

LIST OF CONTRACT DESIGN DRAWINGS

ITEM 29 - COMBUSTION AIR PIPING (1st Step)

Mechanical		No. 30	No. 31 & 32
CE-104503 (2310)	Combustion Air Piping Headers to Test Chambers - Plans, Elevations and Details	85%	90%
CE-104506 (2313)	Combustion Air Piping - Supports, Anchors and Miscellaneous Details	75	90
Reference Drawings			
CE-104511 (2318)	Combustion Air Piping Arrangement of Control Valves & Supports at Test Chambers	0	10
CE-104501 (2301)	Air and Gas Piping First & Second Step Gen. Arrangement Plan	78	80
CE-104502 (2302)	Air and Gas Piping First & Second Step Gen. Arrangement Elev.	78	80
CE-104507 (2314)	Air and Gas Piping First and Second Step Expansion Joint List	50	50
CE-104508 (2315)	Air and Gas Piping First & Second Step Valve List	30	30
CE-104551 (3302)	Air and Gas Piping Grounding System - Plant Details	100	100

ITEM 32A. - HIGH PRESSURE FUEL PUMP HOUSE & SEPARATOR PITS

Structural		No. 30	No. 31 & 32
CE-104643 (4504)	Pump Floor & Metering Floor Roof & Plot Plan Elevs.	5%	90%
CE-104644 (4505)	Elevations	5	90
CE-104645 (4506)	Typical Wall, Window, Door & Stair Details	5	90
CE-104646 (4507)	Plumbing & Finish Schedule		
CE-104649 (4510)	Piling Plan, Foundations Pump Floor & Details	0 30	0 75
CE-104650 (4511)	Framing Plan - Metering Fl., Roof, Col. Sched. and Details	0	75
CE-104651 (4512)	Elevations and Details	0	0
Electrical			
CE-104658 (3504)	HP Fuel Pump House Lighting and Details	0	80
Mechanical			
CE-104620 (2511)	HP Pump House - Heating Ventilating and Details	0	0

Reference Drawings - To be assigned later.

ITEM 33 - PRIMARY ELECTRICAL WORK (1st Step Construction)

Electrical			
CE-104550 (3301)	Outdoor Area Lighting & Receptacle Plans and Details	100	100
CE-104551 (3302)	Air and Gas Piping - Grounding System Plans and Details	100	100
CE-104594 (3402)	C.W. P.H. - One Line Diag. Swgr. & Transf. Arrg't Plan	95	95
CE-104596 (3403)	C.W. Pump House - Equipment Grounding - Conduit Plans and Details	80	90
CE-104597 (3404)	Cooling Tower - Lighting Plan and Details	100	100
CE-104598 (3405)	Cooling Tower - Conduit and Grounding Plans and Details	100	100
CE-104599 (3406)	Power Ducts & Manhole Details	100	100
CE-104600 (3407)	Substation "C" Arrangement Plan and Details	100	100

ITEM 40C. - VACUUM DEAERATOR SYSTEM

General Arrangement - Tanks
Tank Details and Internals
Deaerating Tanks and Fabricated Piping
Plans and Details
Deaerating Tanks and Fabricated Piping
Sections and Details
Structural Steel Supports - Deaerating Tanks

Reference Drawings - To be assigned later.

ITEM 40D. - PIPING SYSTEM - WATER TREATMENT SYSTEM

Flow Diagram
Plot Plan - Location and Interconnections
Softeners - Plan, Elevations and Details
Softeners - Elevations, Sections and Details
Small Piping at Vacuum Deaerators

Reference Drawings - To be assigned later.

ITEM 40E. - CONCRETE AND BUILDING STRUCTURES - WATER TREATMENT SYSTEM

Drawings under Contract #NAw-5851 revised to include building and possibly two (2) new drawings added. (Hansen Contract)

Foundations and Details - Brine Tank
Foundations and Details for Vacuum Deaerator
Foundation Well and Details - Booster Pumps

Note: Electrical work in connection with Water Treatment may be added to Contract for Item #53 - Primary Electrical Work - Equipment Building Area.

ITEMS 51 and 52 - EQUIPMENT BUILDING

Architectural		No. 30	No. 31 & 32
4701	Plot Plan		3
4702	Basement Plan		0
4703	Operating Floor Plan		25
4704	Roof Plan		2
4705	Mezz. Plan and Sections - Control Room		5
4706	Mezz. Plan and Sections - Elec. Mezz.		5
4707	Control Room Details		0
4708	North Elevation		40
4709	South Elevation		40
4710	East Elevation		40
4711	West Elevation		40
4712	Transverse Section		

Architectural (Continued)		No. 30	No. 31 & 32
4713	Longitudinal Section		20
4714	Typical Wall & Window Details-sheet 1		5
4715	Typical Wall & Window Details-sheet 2		0
4716	Typical & Special Door Details		0
4717	Entrance Details		0
4718	Toilet & Locker Room Details		0
4719	Stair & Railing Details - Plans - Sheet 1		5
4720	Stair & Railing Details - Plans - Sheet 2		0
4721	Misc. & Spec. Details - Sheet 1		4
4722	Misc. & Spec. Details - Sheet 2		4
4723	Cold & Hot Water Piping Plans		0
4724	Cold & Hot Water Piping - Sections		0
4725	Sanitary & Storm Sewer Piping - Plan		0
4726	Sanitary & Storm Sewer Piping - Section		0
4727	Schedules, Windows, Doors, Hardware, Finish		0
Structural (Superstructure)			
4731	Roof Framing Plan		20
4732	Roof Truss		10
4733	Control Room Mezz. Framing Plan		0
4734	Electrical Mezzanine Framing Plan		0
4735	Operating Floor Framing Plan		5
4736	Col. Sched. & Crane Girder Details		10
4737	Col. Line Elevations - East & West Walls		0
4738	Col. Line Elevations - North & South Walls		0
Structural (Substructure and Foundations)			
4746	Building Foundation Plan		0
4748	Basement Floor Plan		0
4749	Conc. Encl. for Intake & Exh. Pipe		0
4750	Compressor Foundation Sheet 1		40
4751	Compressor Foundation Sheet 2		10
4753	1st Stage Exhauster Foundation - Sheet 1		50
4754	1st Stage Exhauster Foundation - Sheet 2		0
4755	2nd Stage Exhauster Foundation - Sheet 1		10
4756	2nd Stage Exhauster Foundation - Sheet 2		0
4757	Motor Generator Set Foundations - Sheet 1		0
4758	Motor Generator Set Foundations - Sheet 2		0
4759	Misc. Equipment Foundations		0
4770	Air Heater Foundations		0
4771	Transformer Foundations		0
4772	Refrigeration Equip. Foundations Sheet 1		0
4773	Refrigeration Equip. Foundations Sheet 2		0
Mechanical			
2771	Heating and Ventilating System		10
2712	Heating and Ventilating System		10
2713	Heating and Ventilating System		10
2714	Heating and Ventilating System		10
2715	Control Room Air Cond. System		0
2716	Floor Openings		

Electrical

3701 - Lighting and Grounding Plan - Basement Floor
3702 - Lighting Plan - Basement Mezzanine
3703 - Lighting Details - Basement Floor & Mezz.
3704 - Lighting Plan - Operating Floor
3705 - Lighting Plan - Control Room & Utility Mezz.
3706 - Lighting Details - Operating Floor & Mezz.
3707 - Lighting Plans and Details - Substation "J" and Gas Fired Air Heaters
3708 - Arrangement Plan - Substation "J"
3709 - Elevations & Sections - Substation "J"
3710 - Elevations & Sections - Electrical Bay
3711 - Grounding Details - Including Substation "J" and Gas Fired Air Heaters
3712 - Underground Ductlines and Manhole Details
3713 - Telephone and Signal System - Underground Services

Reference Drawings		No. 30	No. 31 & 32
2701	Operating Floor	10	15
2702	Basement Floor Plan	10	12
2703	Mezzanine Floor Plans	0	0
2704	Cross Sections (2)	10	12
2705	Cross Sections (2)	0	0
2706	Longitudinal Sections (2)	5	7
2707	Longitudinal Sections (2)	0	5

ITEM 54 - AIR AND GAS PIPING EQUIPMENT BUILDING & AIR HEATER AREA

Mechanical

2721	Exh. & Comp. Bleed Piping	0	0
2722	Comb. Air Piping - Equip. Building	0	10
2723	Combustion Air Piping Equip. Bldg. to Air Heaters & Distributing Header - Elev. & Sections	0	10
2724	Combustion Air Piping - After Coolers to Refrig. Sys- Plan	0	5
2725	Comb. Air Piping - After Cooler to Refrig. System - Elevations and Sections	0	5
2726	Comb. Air Piping - Medium and Low Temperature Air from Equip. Bldg. to Dist. Headers - Plans	0	5
2727	Comb. Air Piping - Medium & Low Temp. Air from Equip. Bldg. to Dist. Headers, Elev. & Sections	0	5

Reference Drawings - To be assigned later.

The following is a list of additional contracts with preliminary listing of design drawings to be prepared after the May 1st deadline. The majority of this work is awaiting information resulting from purchase of equipment or requirements needing considerable study before release.

ITEM 53 - PRIMARY ELECTRICAL WORK - EQUIPMENT BUILDING AREA

Electrical

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 drawing - To be assigned later.

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

Mechanical

		No. 30	No.31 & 32
2731	Circulating Water Piping Plan	0	0
2732	Circulating Water Piping Elev.	0	0
2733	Circulating Water Piping Sections	0	0
2734	Circulating Water Piping Details	0	0
2735	Utility Compressed Air Piping - Plan		
2736	Utility Compressed Air Piping Elevations and Sections		

(Item 55 Continued)

		No. 30	No. 31 & 32
2737	Intercooler Drain Piping	0	0
2738	Lubricating Oil Piping - Plan	0	10
2739	Lubricating Oil Piping - Elevations and Sections	0	10

Reference drawing - To be assigned later.

ITEM 56 - REFRIGERATION EQUIPMENT AND PIPING

Mechanical

2741	Gen. Arrgt Plan of Refrigeration and Drying System	0	0
2742	Gen. Arrgt Elevations of Refrigeration and Drying System	0	0
2743	Gen. Arrgt Sections of Refrigeration and Drying System	0	0

Reference drawing - To be assigned later.

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

Mechanical

2751	Instrument Listw	0	0
2752	Instrument Lists	0	0
2753	Instrument Piping - Plan	0	0
2754	Instrument Piping - Elevations and Details	0	0
2755	Control Air Piping - Plan	0	0
2756	Control Air Piping - Elev. and Details	0	0
2757	Hydraulic Valve- Oil Piping - Plan	0	0
2758	Hydraulic Valve - Oil Piping - Details	0	0

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	0	0

Reference drawing - To be assigned later.

ITEM 73 - (34.5 KV CABIE INSTALLATION

Electrical	No. 30	No. 31 & 32
3607 Plot Plan - Manhole Developments 34.5KV Cable Route	0	40
3611 Manhole and Cable Vault Developments, 34.5KV Cable Route	0	0

Reference Drawings - To be Assigned Later.

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

		No. 30	No. 32
1.	Operations Building	99	100
	Amendment #1	99	100
	Amendment #2	100	100
2.	Altitude Test Chambers	98	99
3.	Shop and Access Building	98	98
4.	Test Air Piping	92	94
	Amendment #3	90	100
5.	Cooling Tower & C. W. System	93	95
6.	Fuel Storage and Distribution System	88	93
7.	Electrical Substations	18	30
8.	Equipment Building and Equipment	23	30

DRMcConathy/KBH/RDK/LHR/id

D R McConathy

A98483

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.

A98483

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.

A98483

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,

[redacted]

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

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 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.

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