

# INFORMATION REPORT INFORMATION REPORT

## CENTRAL INTELLIGENCE AGENCY

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S E C R E T

COUNTRY North Korea REPORT [redacted]

SUBJECT [redacted] Plans for Urea Plant Construction in North Korea; DATE DISTR. 30 December 1964

[redacted] NO. PAGES 2 50X1-HUM

REFERENCES RD

DATE OF INFO. [redacted] 50X1-HUM

PLACE & DATE ACQ. [redacted]

THIS IS UNEVALUATED INFORMATION. SOURCE GRADINGS ARE DEFINITIVE. APPRAISAL OF CONTENT IS [redacted] 50X1-HUM-

[redacted]

[redacted] plans for the construction of a urea plant in North Korea:

- a. A description of a urea plant site near the village of Aojidong (N 42-31, E 130-22), North Korea, including information on a local mine and industrial installations in the area, and advance plans for the urea plant construction [redacted] 50X1-HUM
- b. Various charts and graphs related to plans for the urea plant, including:
  - (1) Suggested erection schedule.
  - (2) Suggested composition of the supervision team.
  - (3) Organization schedule of the erection staff.
  - (4) Suggested erection schedule.
  - (5) Map overlay.

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Distribution of Attachments (As Described Above):

ORR (Loan) [redacted]

[redacted]

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**B. Visit to the Construction Site**



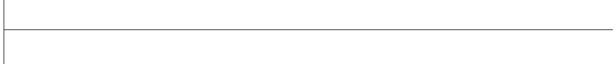
**1. Location**

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An auto ride of about 150 km from Chongjin (the harbor where the parts will arrive) along the coast to Unggi



along a poor secondary road which presumably follows the path along which the Unggi-Aoji rail line will be laid. (See the overlay



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The building site is in a valley several dozen kilometers from the China/Korea/USSR corner of Korea, near the village of Aojidong. Location on map NK 52-6 (1:250,000) and PC 290B (1:500,000): 130° 22'E, 42° 31'N.

The building site is part of a Kombinat (exact name unknown) that lies in the middle of a coal bearing mountain area.

**2. Description**

**a. Coal Processing**

The coal is mined in the area of the Kombinat. The coal is broken, screened and washed; after "Schwellung" to half-cokes whereby tar is separated. The tar is processed into naphthaline, creosote and pitch (no benzene). In front of the warehouse is a separate tank park with many small tanks.

The halfcokes were broken and screened to a pellet size of 5 mm and vaporized in a continuous winkler vaporizer with oxygen (capacity 20,000 m<sup>3</sup> per hour). The vaporizing was expanded to 40,000 m<sup>3</sup> per hour (fanned with O<sub>2</sub> enriched air). They plan to expand the output another 40,000 m<sup>3</sup> per hour in the future. The CO<sub>2</sub> rich gas goes in due course via an H<sub>2</sub>S extraction process and a (with sodium arsenal active) desulpharization installation to a gas container.

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Now the gas (and later a part of the gas) goes to a CO<sub>2</sub> conversion (compressed to 240 atm.), to methanol synthesis. After which it is rectified in a very tall thin column to pure methanol.

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**b. Air Separation Installation**

There is a very old air separation installation in the Kombinat built by the Japanese in 1930. The installation was repeatedly destroyed by American and Japanese bombing, but was rebuilt. The whole thing is very old fashioned, and won't last much longer. Pressure: 200 atm (first axial blowers, afterwards pure). Capacity: 5x1500 m<sup>3</sup>/hour. There are five units, three of them in action, one in reserve and one being repaired. Much copper and brass, but the copper welding work is poor quality.

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**c. NH<sub>3</sub> Synthesis**

There is an NH<sub>3</sub> synthesis in addition, built around the existing synthesis columns (that apparently survived the war). Quality of the apparatus and the welding is very unsatisfactory. The high pressure connections will cause difficulties.

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Ammonium nitrate is produced from a supply of nitric acid. The mechanical maintenance of this installation was very good, the valves and bearings looked good.

**d. Workplace for Apparatus Building**

good welding machines in this work place, but which had not been used much. The cables are bad, coupling pieces missing, joints in the cables were insulated with pieces of jute and cardboard. From superficial observation, the welding appeared good, but had many welding faults (unsatisfactory welding). Rustfree steel welding and argon-arc welding were unknown.

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**e. A Mechanical Work Place**

This looked good; there was good equipment.

**f. An Electric Power Plant**

There is a power plant (that will provide current and condensast); an open-air high-tension station. The high-tension feed is triangular connection: normal 3.3 KV the maximum short circuit current is 74 KA. in the 3 KV net; the maximum short circuit capacity carries 150 MVA. Voltages were not recorded. During the dry months the voltage drops to 3 KV. It will be necessary to check on whether this can carry the HS-motors which will be

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installed in the plant (the low current falls with the weather). The low voltage carries 400 volts with 3.3 KV; with 3 KV the voltages will still be sufficient (about 360 volts).

g. The [Redacted] Urea Plant

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This will not be built on the land of the Kobinst, but on the other side of a bordering stream, across from the high-tension power station. The prills will be transported on a belt transporter along the stream to a spur-line which is to be built from Unggi. The station installation will include offices, warehouses, prill storage sheds and loading platforms.

The materials for the installation will come from the harbor at Chongjin by spur-line to Aoji. Thus, the spur-line must be completed in order for the construction of the plant to begin. [Redacted] the right of way of the new spur-line from Aoji. [Redacted] In some places the tracks had been laid (with electric overhead lines), in other places the foundation was still under construction. [Redacted] doubt [Redacted] that the spur-line would be in operation in time.

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C. Discussion of the Preliminary Project [Redacted]

1. Organization of the construction staff, composition of the supervisory team, the construction plan, and the estimated man hours were discussed and accepted [Redacted]

A promise was received that 1/3 of the total number of Koreans employed in the construction would be trained specialists, 1/3 semi-trained and 1/3 un-trained.

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2. [Redacted] The installation should begin [Redacted] and thus the civil engineering work must be completed by that time.

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3. Welding Rustfree Steel

[Redacted] Welders must be selected and training in argon-arc must be begun. Argon-arc equipment, rustfree steel equipment, portable X-ray equipment (including film) and pipe bending machines were not available. Brochures (with price data) have been requested [Redacted] in order that procurement can be considered. Argon-gas is available, composed of 15% to 20% nitrogen, however, Client requested a statement of needed amounts and desired composition of argon-gas and formiergas [Redacted]

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4. Possibility for Expanding the Plant

It was requested that the planning include a lengthened

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compressor room so that additional compressors might be installed.

### 5. Air

There is clean dry air of 5 atm. present. For large electrical disturbance [redacted] bottles of nitrogen (100-120 atm.) would be built in the plant. The [redacted] company will, therefore, deliver reduction valves (two step).

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### 6. Civil Work

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The building [redacted] in the Kombinat were very old and repeatedly rebuilt (after the bombings). [redacted] (concrete or steel construction with brick fillings), mostly very poor. Therefore, [redacted] requested precise details on the new buildings. The skeleton would be prefabricated concrete (as in the USSR), the walls brick masonry, and both sides plastered. A part of the walls would be closed off with prefabricated concrete plates. In any event, the roofs and floors would be of prefabricated concrete plates. In places where heavy apparatus will be placed, a strong floor would be built. Light construction would not have deep foundations. For the heavy, there is a weight bearing layer (115 tons/cubic meter) about 6 meters deep. It is not yet decided whether to dig so deep, perhaps only for the compressors and the prill towers. The upper layer is [redacted] in dry weather, very hard and cracked, in rainy weather, very slippery and not porous. Appears reddish and clay-like [redacted]. Below this layer is disintegrated rocks. The electric cables would be placed in conduits in the disintegrated rock soil. The soil would be loosened with mattocks.

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In connection with the expected costs [redacted] client requested blueprints and studies as soon as possible, and not to wait for definitive drawings to be completed.

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### 7. Material Transport

[redacted] the station emplacement will be completed along a good road. They have had some experience with hoisting of autoclaves, but [redacted] instruction on hoisting was requested.

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### 8. Fire Protection

No special fire protection, no sprinklers. Aside from a normal amount of hydrants and hoses, on each floor there will be some dry extinguishers.

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9. QA. Cooling Water

The analysis of the cooling water

is ca-24.7 mg/l; Mg 2.18 mg/l; K+n<sub>2</sub> 9.43 mg/l; Cl 13.47 mg/l; SO<sub>4</sub> 10.08 mg/l; HCO<sub>3</sub> 75.64 mg/l; free CO<sub>2</sub> 59 mg/l; pH 7.15; Total hardness 3.94<sup>OD</sup>, temporary 0.58<sup>OD</sup>, lasting 3.37<sup>OD</sup>; evaporation residue 444 mg/l. This last, because melted snow is used, is very dirty and sandy. Normally this is much lower.

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10. Lighting

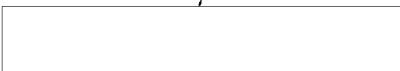
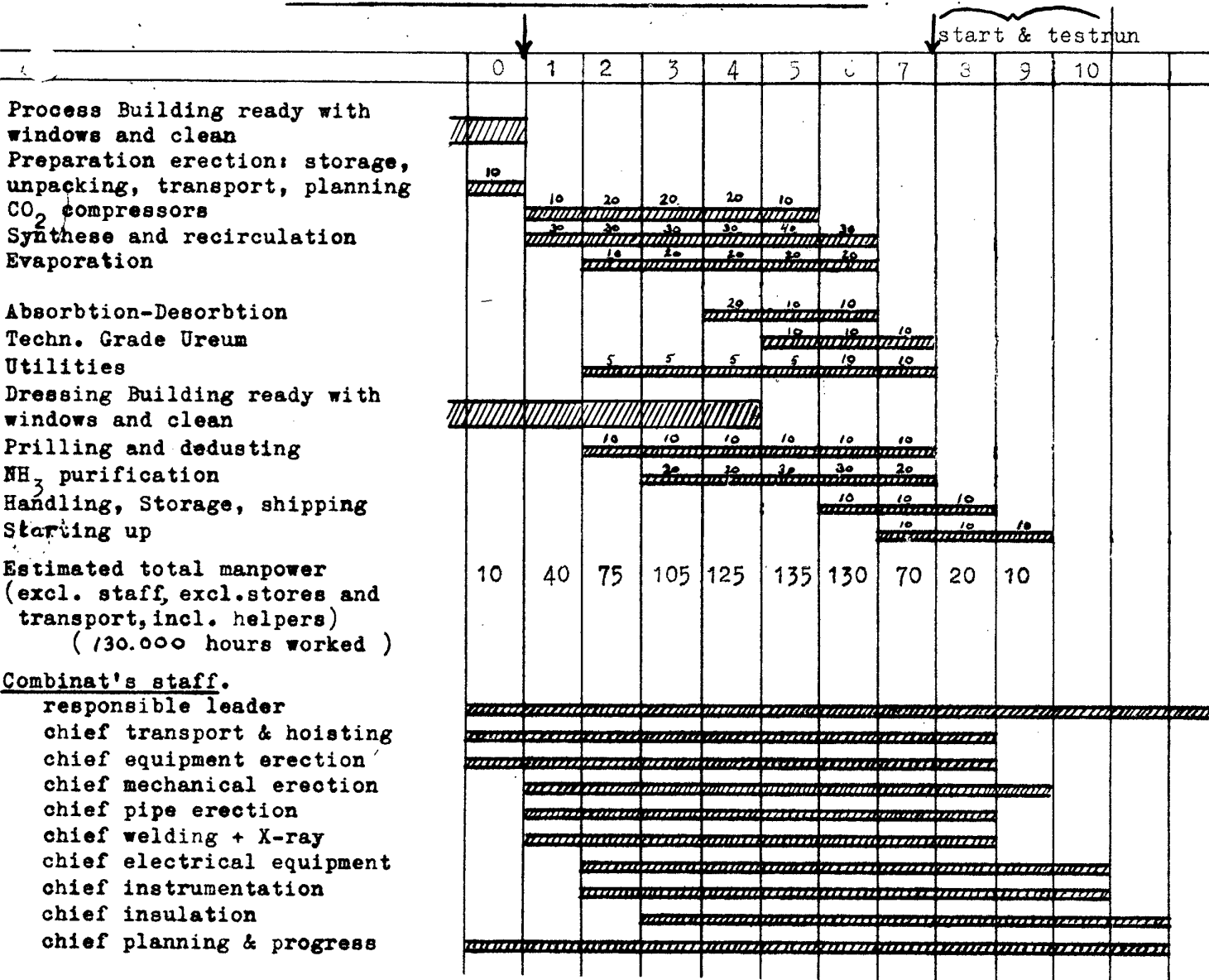
During discussions on this point, it appeared that client manufactures no sodium lights, but does have mercury. The wattage will have to be increased.

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SUGGESTED ERECTION SCHEDULE (RSJ)





SUGGESTED COMPOSITION SUPERVISION TEAM

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KOREA

5 fam.

- + 1 Chief Engineer - teamleader
- + { 1 Liaison Engineer (techn.admin.)
- + { 1 Materials & Planning Supervisor
- + { 1 Mechanical Supervisor
- + { 1 Compressor Supervisor
- + { 1 Pipefitting Supervisor
- + { 1 Welding 1 X-ray
- + { 2 Instrumentation Engineers
- + { 2 Electrical Engineers
- + { 1 Insulation Specialist
- + { 1 Supervisor (process spec.)

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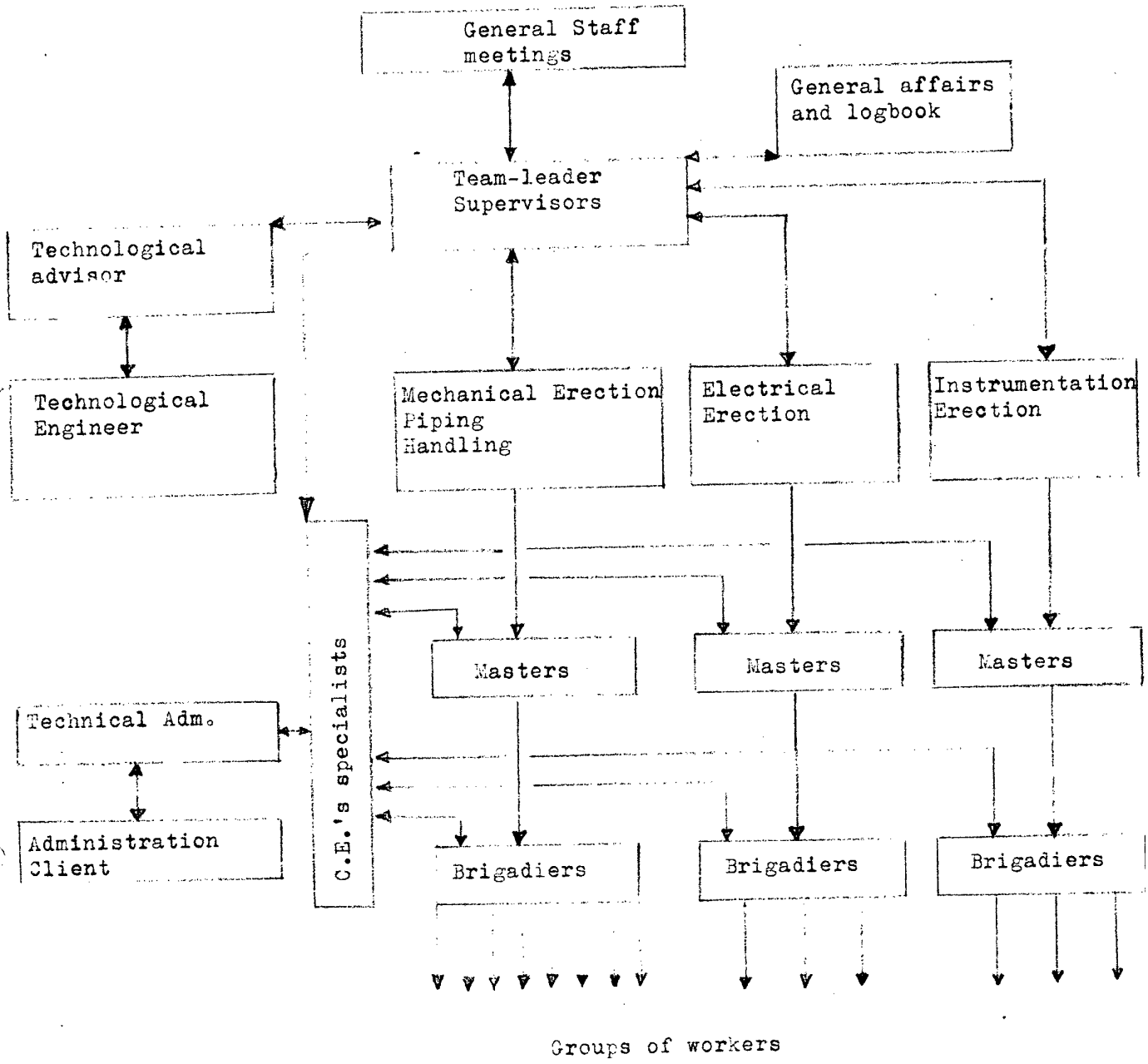
- Start :
- 1 Superint.
  - 2 Starting-up Engineer
  - 2 Instrumentation Engineers
  - 1 Start Engineer Halberg

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ORGANISATION SCHEDULE ERECTION STAFF

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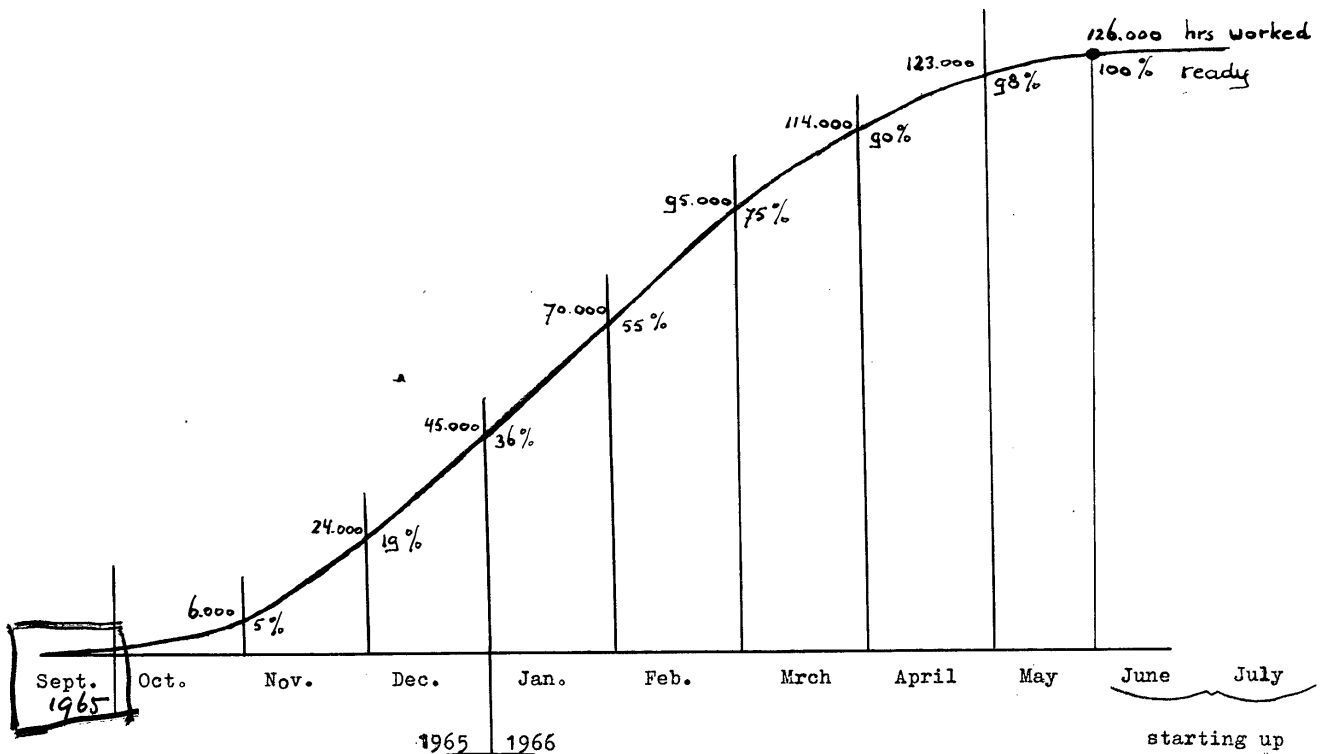
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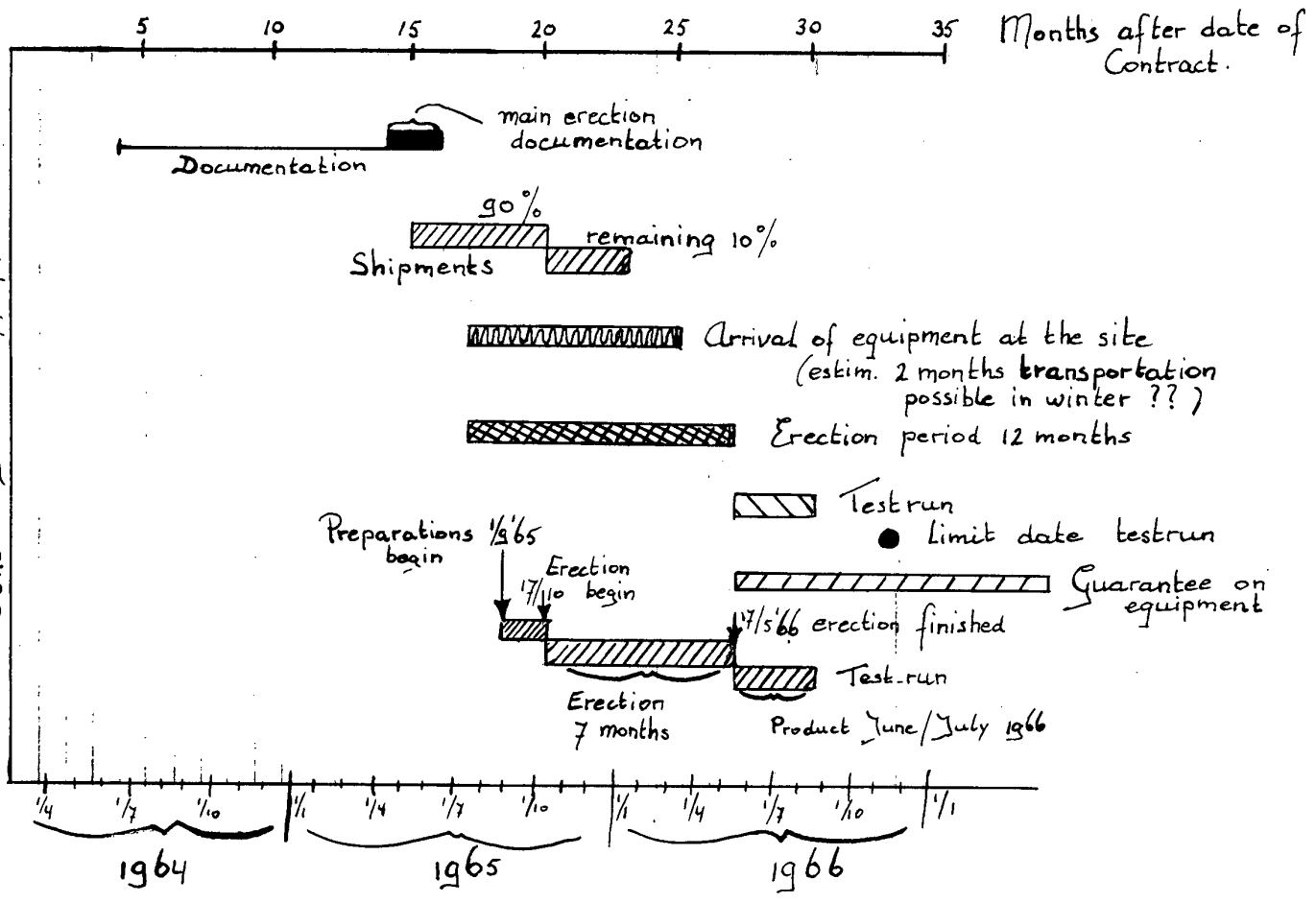
SUGGESTED ERECTION AOJI.





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Contract Date 17/2/1964



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