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BASIC IMAGERY
INTERPRETATION
REPORT

NATIONAL PHOTOGRAPHIC
INTERPRETATION CENTER

SHEN-YANG AIRCRAFT ENGINE PLANT 410

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25X1

STRATEGIC WEAPONS INDUSTRIAL FACILITIES
CHINA
NOVEMBER 1972

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25X1

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RCA-09/0020/73

COPY NO 124

11 PAGES

INSTALLATION OR ACTIVITY NAME					COUNTRY
Shen-yang Aircraft Engine Plant 410					CH
UTM COORDINATES	GEOGRAPHIC COORDINATES	CATEGORY	RE NO.	COMIREX NO.	NIETB NO.
NA	41-47-35N 123-30-32E				25X1

MAP REFERENCE

SAC. US Air Target Chart, Series 200, Sheet 0290-11, scale 1:200,000

LATEST IMAGERY USED	NEGATION DATE (If required)
	NA 25X1

ABSTRACT

1. Shen-yang Aircraft Engine Plant 410 is one of the major aircraft engine plants in Communist China. It is believed to produce the RD-9B turbojet engines for the FARMER and may also produce sustainer engines for the Chinese surface-to-air missile (CSA-1).

2. The major plant construction at Plant 410 occurred between 1944 and 1962. Since then, construction has been minor. Plant 410 contained 391,527 square meters (4,214,357 square feet) of floorspace as of July 1972.

3. This report supersedes an NPIC report- RCA-09/0015/69, *Shenyang Aircraft Engine Plant 410,* Jan 69 (TOP SECRET 25X1 25X1). It contains a location map, a photograph and a line drawing of the installation, a photograph and a line drawing of the major test cells, and mensural and chronological data.

INTRODUCTION

4. Shen-yang Aircraft Engine Plant 410 is located 5 nautical miles (nm) east of the center of Shen-yang (Mukden), China (Figure 1). By 1956 the original plant, which was first seen on photography in 1944, [1] had undergone major expansion to include a large adjacent area which formerly belonged to the Shen-yang Arsenal 90th. By 1962 two aircraft engine test buildings had been constructed in the former arsenal area.

5. Other significant installations in the vicinity include Shen-yang Airframe Plant 112 , 5 nm northwest, and the Wen-kuan-tun Ammunition Plant 724 25X1 4.7 nm north of Plant 410. The development of Shen-yang Airframe Plant 112, 25X1 which produces the FARMER and the sustainer for the CSA-1, corresponds chronologically with the development of Plant 410. [2] The two installations expanded most rapidly between 1944 and 1956; both appeared basically complete in 1962. It has been Chinese practice to build engine plants in close proximity to airframe plants so that interface between the plants would be more efficient and effective. Shen-yang Rocket Engine Test Facility (BE located 13 nm northeast of Plant 410, is an operational static test facility 25X1 probably involved in the CSA-1 missile program. This facility may also be associated with Plant 410.

6. Plant 410 has direct access via roadway to the Shen-yang/Tung-ta Airfield (BE 0.3 nm south of the plant (Figure 1) and to the aircraft repair facilities at the 25X1 northeast end of this airfield.

BASIC DESCRIPTION

7. Shen-yang Aircraft Engine Plant 410 encompasses 333 acres and contains 276 structures with a total floorspace of 391,527 square meters (4,214,357 square feet).

8. The original engine plant buildings are located in the eastern section of Plant 410. These buildings and those subsequently built in this area are separated from the annexed Shen-yang Arsenal 90th area by a narrow strip of land and a canal (Figures 2 and 3). However, the two areas are interconnected by a common rail line and paved roads. The principal buildings identified at Plant 410 include assembly/shops, shops, engine test buildings, administration and engineering buildings, forges and foundries, warehouses,

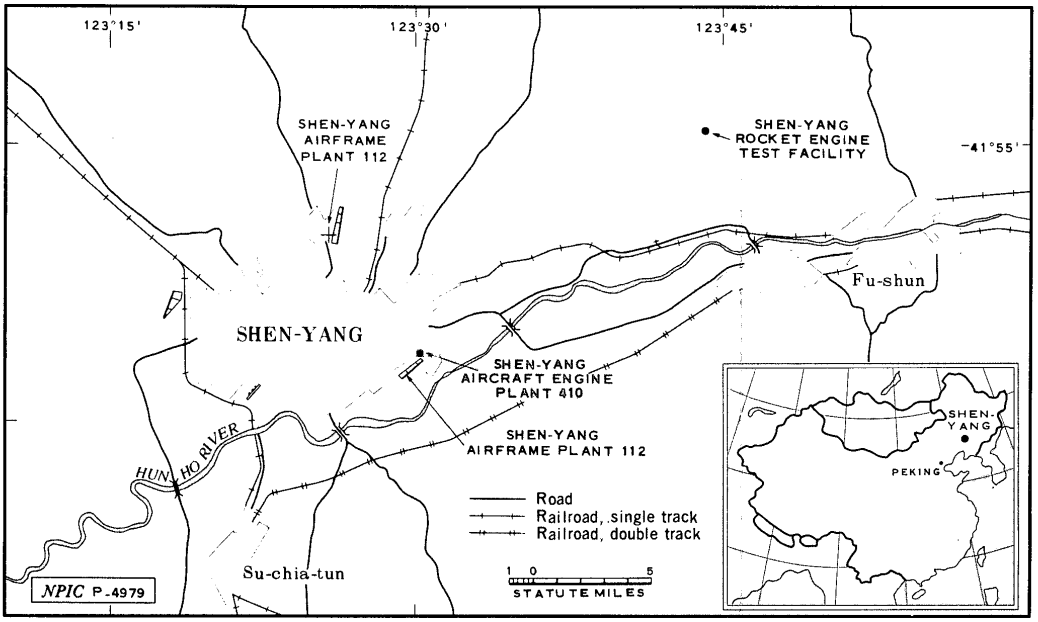

FIGURE 1. LOCATION MAP

storage buildings, support buildings, and heating plants. The functional distribution of the floorspace is presented in the following tabulation.

Functional Description	Floorspace Square meters	Square feet
Assembly/shop buildings		1,238,732
Shop buildings		1,401,147
Engine test buildings		139,532
Administration and engineering buildings		401,138
Forge and foundry buildings		118,218
Warehouses		526,182
Support and miscellaneous buildings		338,266
Heating plants		51,139
		4,214,357

25X1

Production

9. It is believed that Plant 410 produces the Chinese version of the RD-9B engine. This afterburning turbojet engine, originally designed by the Soviets, is used in the twin-engine FARMER (MIG-19). RD-9B engine and afterburner crates have been identified at the plant. The Chinese version of the FARMER is being produced at the nearby Shen-yang Airframe Plant 112 which also produces sustainers for the CSA-1. The sustainer engine for this missile system may be produced at Shen-yang Engine Plant 410. The nearby Shen-yang Rocket Engine Test Facility has test cells that could accommodate the testing of these sustainer engines.

Engine Test Buildings

10. Shen-yang Aircraft Engine Plant 410 has three engine test cell buildings containing a total of 17 test cells (items 24, 130 and 173, Figure 3; Figures 4-7). The largest of these buildings (item 130) is located in the former Shen-yang Arsenal 90th area and was first seen in 1962. It (Figure 4) consists of an engine preparation section, a control and instrumentation section, three double L-type engine test cells, and four single L-type engine test cells. Eight of the cells were operationally complete in 1962. Each test cell

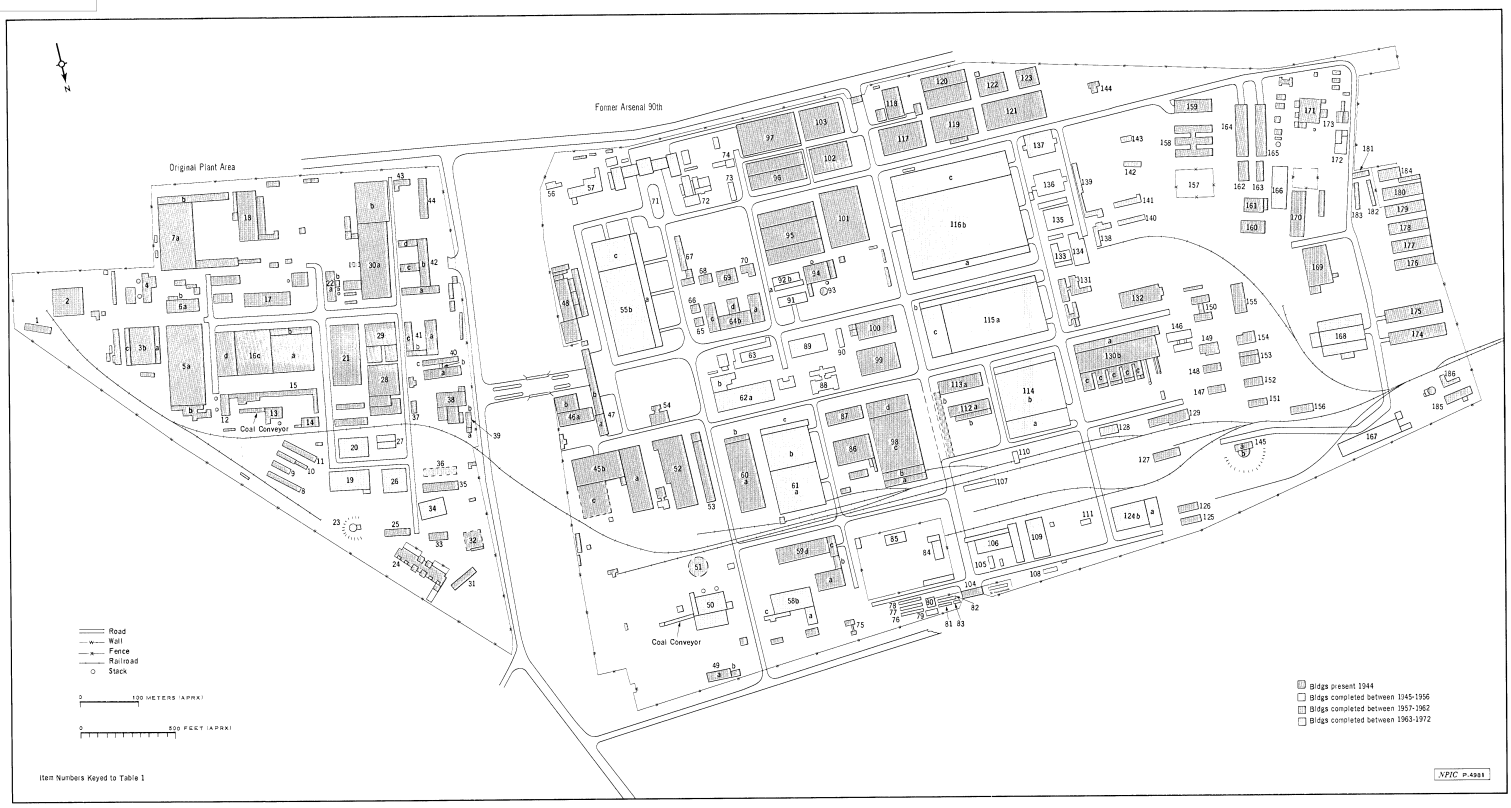

FIGURE 3. LAYOUT OF SHEN-YANG AIRCRAFT ENGINE PLANT 410

Table 1. Function, Dimensions, and Construction Chronology of Facilities at Shenyang Aircraft Engine Plant #10, China
(Items keyed to Figure 2)

Item	Function	Dimensions* meters (feet) L W H	Floorspace sq meters (sq feet)	Date Considered Complete**	Remarks
1	Storage bldg			Aug 62	
2	Storage bldg			Aug 62	Consists of 5 rectangular parallel sections
3	Shop bldg				
a	Prob small parts sections			Dec 44	
b	H gh bay section			Dec 44	
c	Prob small parts section			Dec 44	
4	Forge			Dec 44	2 stacks 20 m (66 ft) high are attached to bldg
5	Shop bldg				
a	Shop section			Dec 44	
b	Admin section			Dec 44	
6	Shop bldg				
a	Shop section			Aug 62	
b	Prep ving section			Aug 62	
7	Shop bldg				
a	Shop section			Dec 44	
b	Water ars storage sect on			Dec 44	
c	Water ars storage sect on			Dec 44	
8-11	Warehouses			Dec 44	
12	Forge			Dec 44	2 stacks 20 m (66 ft) high are attached
13	Heating plant			Aug 62	1 stack high attached bldg equipped w th coal dehydrator
14	Support bldg			Aug 62	
15	Support bldg			Aug 62	
16	Shop b dg				
a	Shop sect on			Dec 44	
b	Admin ng			Dec 44	4 stories
c	Shop sect on			Dec 44	
d	Shop sect on			Dec 44	High bay
17	Admin bldg			Aug 62	2 stories
18	Warehouse			Aug 62	
19	Shop b dg			Jan 56	
20	Shop b dg			Jan 56	
21	Shop b dg			Dec 44	
22	Heat treatment shop				
a	Shop sect on			Aug 62	2 stacks high attached to bldg
b	Support sect on				Roof has deter orated
23	Fuel storage fac ity			Jan 56	Fac ity consists of 22 fuel points
24	Engine test cell bldg			Dec 44	Exhaust stack added to one cell Aug 63
25	Prob t est support bldg			Dec 44	
26	Storage bldg			Jan 56	Consists of 5 rectangular parallel sections
27	Warehouse			Jan 56	
28	Shop b dg			Dec 44	
29	Shop b dg			Dec 44	
30	Assembly Shop bldg				
a	Shop sect on			Dec 44	A shed attached to bldg has deteriorated High bay, arched roof
b	Assembly sect on				
31	Prob t est support			Dec 44	
32	Prob abandoned exhaust			Dec 44	Measurements are of remaining wall
33	Heating plant			Dec 44	2 stacks-one
34	Support bldg			Jan 56	
35	Warehouse			Dec 44	
36	Prob warehouse addn			→	Excavation & footings in place
37	Support bldg			Dec 44	
38	Shop b dg			Dec 44	
39	Support bldg				
a				Dec 44	
b				Dec 44	
40	Admin				
a	Admin section			Aug 62	
b	Corridor			Aug 62	
c	Admin section			Aug 62	
41	Vehicle maint b dg				
a	Maint section			Dec 44	
b	Vehicle shed			Dec 44	
c	Vehicle shed			Dec 44	
42	Admin ng b dg				
a				Dec 44	Th s E shaped b dg has 4 stories in each section
b				Dec 44	
c				Dec 44	
d				Dec 44	
43	Admin bldg			Aug 62	
44	Admin bldg			Aug 62	
45	Shop bldg				
a	Shop section			Dec 44	H gh bay section with shed roof mon tor 6 roof mon tors
b	Shop section			Dec 44	
c	Generator shed sect on			Dec 44	Entry the outer walls remain on th s sect on
46	Support b dg				
a	Veh cle maint section			Dec 44	
b	Admin			Dec 44	
47	Admin b dg				
a	Support sect on			Dec 44	
b	Admin sect on			Dec 44	2 stories
48	Storage b dg			Aug 62	Interconnected storage sheds
49	Shop bldg				
a				Aug 62	
b				Aug 62	
50	Heating plant			Jan 56	Bldg was joined w th coal dehydrator 2 stacks attached to bldg Circular excavation
51	Fuel storage tank wash				
52	Foundry			Dec 44	
53	Forge			Dec 44	Part has 4 stacks each
54	Admin b dg			Aug 62	
55	Assembly shop dr g				
a	Engr Admin section			Jan 56	2 stories
b	Assembly shop sect on			Jan 56	10 roof mon tors
c	Assembly shop sect on			Jan 56	2 roof mon tors
56	Support bldg			Jan 56	
57	Support bldg			Jan 56	
58	Support bldg				
a				Jan 56	
b				Jan 56	
c				Jan 56	
59	Machine shop				Interconnected shop bldgs
a	Heat treatment section			Aug 62	
b	Shop section			Aug 62	
c	Shop section			Aug 62	
d	Shop section			Aug 62	
60	Foundry				
a	Heat treatment section			Aug 62	High bay
b	Shop section			Aug 62	
61	Assembly shop b dg				
a	Assem shop section			Jan 56	
b	Assem shop sect on			Jan 56	
c	Admin ng sect on			Jan 56	2 stories
62	Machine shop				
a	Heat t reatment sect on			Jan 56	
b	Shop sect on			Jan 56	
63	Support bldg			Jan 56	
64	Admin ngen bldg				
a				Aug 62	3 stories
b				Aug 62	3 stories
c				Aug 62	3 stories
d				Aug 62	
65	Support bldg			Aug 62	
66	Support b dg			Aug 62	
67	Admin ng bldg			Aug 62	
68	Admin ng bldg			Aug 62	
69	Admin ng bldg			Aug 62	
70	Admin ng bldg			Aug 62	
71	Admin ng bldg			Jan 56	3 stories
72	Admin b dg			Jan 56	2 stories
73	Veh cle shed			Jan 56	
74	Support bldg			Jan 56	
75-83	Warehouses			Jan 56	Var ous sizes
84	Substation contro bldg			Jan 56	
85	Substation contro bldg			Jan 56	
86	Shop bldg			Dec 44	
87	Shop bldg			Dec 44	
88	Admin bldg			Jan 56	
89	Shop bldg			Jan 56	
90	Spray ponds			Jan 56	
91	Shop bldg			Jan 56	
92	Shop b dg				
a	Low bay sect on			Jan 56	
b	H gh bay sect on			Jan 56	
93	Water tower			Dec 44	
94	Heat ng plant			Dec 44	2 stacks-one
95	Assembly shop bldg			Dec 44	
96	Shop b dg			Dec 44	
97	Shop bldg			Dec 44	Roof has 8 sawtooth sections
98	Assembly shop bldg				
a	Receiving shipping section			Aug 62	Rail served
b	Receiving shipping section			Aug 62	Rail spur extends through sect on
c	Assem shop section			Aug 62	
d	Assem shop section			Aug 62	
99	Foundry			Aug 62	
100	Heat treatment shop b dg			Aug 62	
101	Shop b dg			Dec 44	
102	Shop bldg			Dec 44	
103	Shop bldg			Dec 44	Roof has 7 sawtooth sections
104	Entrance control b dg			Dec 44	
105-111	Warehouse storage b dg			Jan 56	7 bldgs of various sizes
112	Shop bldg				
a				Aug 62	
b				Aug 62	
113	Shop bldg			Aug 62	
a	H gh bay section				
b	Station vash				Rectangular excavation
114	Assembly shop bldg				
a	Assembly shop sect on			Jan 56	H gh bay
b	Assembly shop sect on			Jan 56	
c	Admin ng section			Jan 56	2 stories
115	Assembly shop bldg				
a	Assembly shop sect on			Jan 56	
b	Assembly shop sect on			Jan 56	
c	Admin ng sect on			Jan 56	3 stories
116	Assembly shop bldg				
a	Admin ng section			Jan 56	3 stories
b	Assembly shop sect on			Jan 56	
c	Assembly shop sect on			Jan 56	High bay
117	Shop bldg			Dec 44	Roof has 6 sawtooth sections
118	Shop bldg			Dec 44	Roof has 8 sawtooth sections
119	Shop bldg			Dec 44	Roof has 7 sawtooth sections
120	Heat treatment shop bldg			Dec 44	
121	Shop bldg			Dec 44	
122	Shop bldg			Dec 44	
123	Shop bldg			Dec 44	
124	Shop bldg				
a				Jan 56	
b				Jan 56	
125-129	Warehouses			Aug 62	
130	Engine test cell bldg				
a				Aug 62	
b				Aug 62	A single diffuser added Oct 56, two diffusers added May 61
131	Prep meshall			Aug 62	
132	Shop bldg			Aug 62	
133	Shop bldg			Jan 56	
134	Shop bldg			Jan 56	
135	Shop bldg			Jan 56	
136	Shop bldg			Jan 56	Roof has 5 sawtooth sections
137	Shop bldg			Jan 56	Roof has 5 sawtooth sections
138-144	Storage sheds			Oct 56	
145	Fuel storage fac ity				
a				Aug 62	Fac ity contains 30 fuel points
b					
146	Support b dg			Jan 56	
147-156	Storage bldgs			Aug 62	2 addn
157	Secured storage area			Aug 62	Open storage materials
158	Warehouses (4)			Dec 44	4 parts in interconnected warehouses
159	Warehouses			Dec 44	
160	Shop bldg			Dec 44	
161	Shop bldg			Dec 44	High attached
162	Shop bldg			Dec 44	Probable water tower centered on top of roof
163	Shop bldg			Dec 44	
164, 165	Warehouses			Dec 44	
166	Reservoir			Jan 56	
167	Shop bldg			Jan 56	
168	Shop bldg			May 63	
169	Storage b dg			Aug 62	7 parallel rectangular interconnected storage bldgs
170	Enclosed storage			Aug 62	Fenced area for open storage
171	Prob compressor/inert b dg			Dec 44	
172	Test control bldg			Jan 56	
173	Engine test cell bldg				
a	Control room			Aug 62	
b	Large test cell			Aug 62	
174-184	Warehouses			Dec 44	
185	Support bldg			Aug 62	
186	Support b dg			Aug 62	

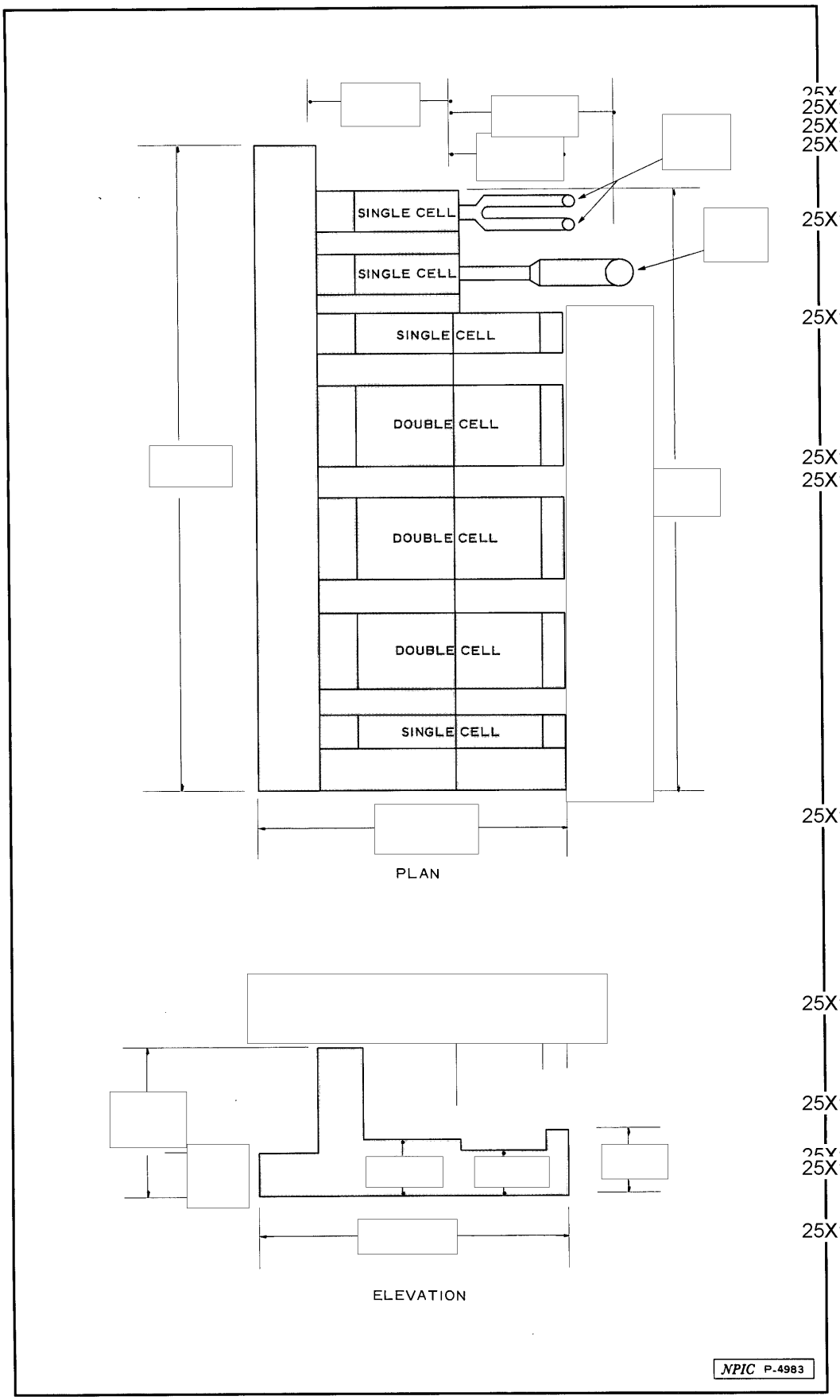

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FIGURE 5. LINE DRAWING OF ENGINE TEST CELL BUILDING

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consists of a raised flat-roofed intake tower, an engine test section, and an exhaust section. The eight test cells are identical, with the exception of the vertical exhaust ports--four of which are hinged and four which have opened or grilled apertures. Four probable observation/control compartments are positioned between the cells to monitor engine test proceedings. The eight test cells are similar to the engine test cells at Cheng-tu Aircraft Engine Plant The long exhaust treatment section of each test cell probably contains a cylindrical duct which acts as a resonator/silencer similar to those at Cheng-tu.[3] The remaining two test cells in the building are similar to the other eight, except for the exhaust/silencer treatment sections. A cylindrical chamber exits one test cell and divides into two parallel silencers/diffusers with vertical exhaust ports. The other test cell consists of a single cylindrical silencer/diffuser. It expands from to in the exhaust/silencer chamber. This cell also has vertical exhaust port. The exhaust/silencer chambers of two test cells were added in 1966 and 1967.

11. An engine test cell building (item 24, Figure 3; Figure 6) was present in the original plant area in 1944. The rectangular building consists of two U-type engine test cells and four through-type engine test cells. One of the through-type engine test cells was modified in 1963 by the addition of a walled concrete exhaust apron used to prevent ground erosion from engine efflux.

12. The third engine test facility consists of three buildings (items 171--173, Figure 3; Figure 7). A former diesel powerplant (item 171, Figure 7) had been converted between 1956 and 1962 into a probable compressor/test building. This building now appears to be inactive and in a state of disrepair. Sections of the exhaust system have been either dismantled or are deteriorating. Another probable test building (item 173, Figure 7) consists of a control room and an L-type test cell. This building also appears to be inactive and partially dismantled. The test cell building is connected to a probable control/engine test preparation building (item 172, Figure 7) by a large conduit. It is doubtful that any of the three buildings which constitute this facility are now being used in the plant's engine test program.

Chronology

13. When Plant 410 was first seen on photography in 1944, the original plant area contained 66,520 square meters (716,014 square feet) of floorspace. Buildings complete at that time included an engine test cell building (item 24) an assembly/shop building (item 30), two forges (items 4 and 12), and eight shop buildings (items 3, 5, 7, 16, 21, 28, 29, and 38). Shen-yang Arsenal 90th area then contained 80,092 square meters (862,102 square feet) of floorspace. Buildings at the arsenal area at that time included four foundries, 11 shop buildings, and several warehouses.

14. By 1956, the Shen-yang Arsenal 90th area had been annexed by Plant 410. It was also evident that several major buildings had been completed in both of these areas. These included five major assembly/shop buildings (items 55, 61, and 114--116) and a fuel storage facility (item 23). The total floorspace for Plant 410 as of 1956 was 291,030 square meters (3,132,617 square feet). The construction program in both plant areas from 1945 through 1956 had nearly doubled the total floorspace available.

15. A high-level of construction activity continued from 1957 through 1962. The major additions included an engine test cell building (item 130) and the conversion of a powerplant to a probable compressor/test building (item 171, Figure 3; Figure 7). The total floorspace of the plant by August 1962 was 381,930 square meters (4,111,056 square feet). Modifications were made on the engine test cell building (item 130) with the addition of silencers/diffusers on two test cells (item 130c); one cell was modified in 1966 and the other in 1967. However, since 1963 construction activities observed at the plant other than the test cell addition have been minor. These have consisted primarily of support-type structures.

Essential Services

16. Shen-yang Airframe Plant 410 is served by both road and rail. A network of good roads interconnects the plant facilities, and a paved road extends from the plant to the city center of Shen-yang. A railroad spur which extends from the main rail system serving Shen-

yang enters the plant from the west and terminates at the east end of the plant. Within the plant, several tracks extend from the spur to serve the two fuel storage facilities, warehouses, and an assembly/shop building.

17. Shen-yang/Tung Ta Airfield has facilities to support the logistical needs of Plant 410. This airfield has a concrete runway with a concrete parallel taxiway and five concrete parking aprons. 25X1

18. Electrical power is available to the Shen-yang area from the resources of a large hydroelectric powerplant and a large thermal powerplant complex near Fu-shun, approximately 23 nm east of Plant 410. Plant 410 has its own substation and several small heating plants to support its heating requirements.

Security

19. Both plant areas are separately secured by walls. Guard posts or control buildings monitor each access point. In the original aircraft engine production area, guard towers are located at various points near or along the wall. Defensive personnel trenches are also located inside the eastern wall of this area. No other special security measures were noted throughout the plant areas.

REFERENCES

IMAGERY

Project/Mission	Date	Pass/Op	Camera	Frame/Index	Classification/Control

25X1

MAPS OR CHARTS

SAC. US Air Target Chart, Series 200, Sheet 0290-11, scale 1:200,000

DOCUMENTS

1. NPIC. CIA/PIR-1003/64, *The Chinese Communist Aircraft Industry, 1944-1963,* Apr 64 (SECRET/No Foreign Dissem)
2. NPIC. RCA-09/0035/70, *Shenyang Airframe Plant 112,* Feb 70 (TOP SECRET 25X1
3. USAF , FTD-SP-17-1-71, *Air Force Foreign Technology Bulletin,* 3 Jun 71 (TOP SECRET RUFF/No Foreign Dissem)

REQUIREMENT

COMIREX J04
NPIC/IEG/SD/SIB Project 223335

*Although KH Mission 1203 is the most recent coverage of this plant, the best photography is obtained from 25X1
25X1