INCOMPLETE

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Tactical Mission REPORT

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By authority of
C.G., Twentieth Air Force
21 Mar 49
(Date) (Initials)

MISSION NO. 277-281
FLOWN 19 JUL 1945
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HEADQUARTERS
TWENTIETH AIR FORCE
APO 234

7-55-54

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HEADQUARTERS
TWENTIETH AIR FORCE
APO 234

TACTICAL MISSION REPORT

Field Order No. 2 Missions No. 277, 278, 279, 280 and 281.

Targets: Fukui Urban Area (90.15), Hitachi Urban Area (90.14), Chosi Urban Area (90.14), Okazaki Urban Area (90.20), and Nippon Oil Refinery (90.25 - 1203).

19/20 July 1945

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Prepared By: A-2 Section
Twentieth Air Force

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Twentieth Air Force
19 Jul 45 E.M.S.
Date Initials

HEADQUARTERS
TWENTIETH AIR FORCE
APO 234

SUBJECT: Report of Attacks on Fukui, Hitachi, Chosi and Okazaki Urban Industrial Areas and the Nippon Oil Refinery at Amagasaki on the Night of 19/20 July 1945.

TO: Commanding General, U.S. Army Strategic Air Force, APO 234, San Francisco, California

1. IDENTIFICATION OF REPORT:

a. Targets Attacked:

(1) Primary Visual and Radar Targets:

Mission Number	Target
277	Fukui Urban Area (90.15) Honshu
278	Hitachi Urban Area (90.14) Honshu
279	Chosi Urban Area (90.14) Honshu
280	Okazaki Urban Area (90.20) Honshu
281	Nippon Oil Refinery (90.25-1203) Honshu

(2) No secondary or last resort targets were specified.

b. Force Attacking:

Mission Number	Wing	Effort
277	58th	4 Groups-Normal
278	73rd	4 Groups-Normal
279	313th	3 Groups-Normal
280	314th	4 Groups-Normal
281	315th	70 Aircraft

c. Directive: Field Order Number 2, Headquarters Twentieth Air Force, dated 19 July 1945, directed the 58th, 73rd, 313th, 314th and 315th Bombardment Wings to attack 4 Urban Industrial Areas and the Nippon Oil Refinery, Amagasaki, all on Honshu, in Twentieth Air Force Missions Number 277 through 281.

2. MISSION PLANNING:

a. Selection of Targets:

(1) Targets Considered: Cities selected followed the standard operating procedures set up for night incendiary attacks. The

cities were among the 180 selected for attack under the Small Industrial Urban Areas Plan. Targets selected were: Fukui, Hitachi, Chosi, Okazaki and the Nippon Oil Refinery.

(2) Targets Selected and Reasons: Reason for selection of these cities for attack, conformed to the basic requirements of having adequate radar scope photos, target intelligence and reconnaissance of the target areas. The precision strike was planned to be executed simultaneously with the incendiary missions on the basis of previous similar successful operations.

b. Importance of Targets:

(1) Fukui is an important railroad center, with a population of 97,967, located approximately 40 miles north of Biwa Ko, 70 miles southwest of Toyama and 13 miles inland from the coast on the north side of Honshu. Fukui is 3 miles on its north to south axis, 2 miles east to west, and has an overall area of 3½ square miles, with 2 square miles being highly congested. Ninety-five known industries are in the target area and industrialized products of the city include aircraft parts, electrical equipment, machine motors, various metal products and textiles. Successful attack of this target would destroy industries, disrupt rail communications, and decrease Japan's recuperative potential.

(2) Hitachi is an important industrial city, located 80 miles northeast of Tokyo, on the east coast of Honshu. Within the city are 6 factories, part of the Hitachi Engineering Company complex for the production of electrical equipment. The copper mine at Hitachi supplies 1/10 of Japan's total supply of copper. The city has 1 incendiary zone of 1.2 square miles, having a population density of approximately 50,000 per square mile, and the second zone of 1.9 square miles, which has a population density of approximately 30,000 per square mile. Four numbered targets are within the city proper, and another numbered target, a copper smelter, is 2 miles northwest of the city. Another target is 2 3/4 miles southwest of the city. Successful attack on Hitachi would destroy Japanese industries and decrease the Japanese recuperative potential.

(3) Chosi is located on the east coast of Chiba Peninsula, on the south bank at the mouth of the Tone River, approximately 60 miles east of Tokyo. Chosi is the important fishing center that supplies Tokyo, and is the second largest city on the Chiba Peninsula. It is noted for its canneries and can manfacturing. Successful attack would destroy 1 of Tokyo's main sources of food supply.

(4) Okazaki is located approximately 18 miles southeast of Nagoya Castle on the Yahagi River, 16 miles northwest of Toyohashi, and 9 miles east of the north tip of Chita Bay. Okazaki is important principally because of the presence of many small factories performing sub-contract work for the major concerns in Nagoya. Also there are a number of medium size and a few large plants in the area around the city, all of which depend on Okazaki for food, shelter and communications. The city has a population of 84,073, with the population density varying from approximately 30,000 to 50,000 per square mile. The city covers an area of approximately 2 square miles. Successful attack of this target would destroy the supporting small industry in the Nagoya area, and would curtail Japan's recuperative ability.

(5) The Nippon Oil Refinery is 1 of Japan's most important refineries, having a capacity of nearly 2,000,000 barrels and a

storage capacity of approximately 1,000,000 barrels. The target is located in the Amagasaki waterfront area, at the mouth of the Muko River, and stretches over an area of 3000 feet by 3000 feet, the main part being 1200 feet by 2000 feet, with a tank farm of 12 large tanks located approximately 600 feet from the main target area. The synthetic plant was estimated to produce 200,000 barrels annually. Successful attack would destroy an important source of oil supply and decrease the enemy's recuperative potential.

c. Time Factors:

(1) Selection of D-Day: Selection of the day for attack was dependent on weather conditions over the Empire that would permit execution of these radar-planned missions.

(2) Selection of Target Time: Target time was governed by take-off and landing time of the striking force in order to have landings of the main force be during daylight hours.

d. Munitions and Fuel Loading:

(1) Selection of Bombs and Fuzes: This was governed by the type of target and the size of the attacking force.

(a) Fukui Urban Area: The bombs loaded for this mission had actually been planned for an attack on Omuta. One Group was to be loaded with M47 incendiary bombs and 3 Groups were to carry E46 incendiary clusters containing M69 bombs. Each aircraft carrying M47 incendiary bombs was also scheduled to carry 1 M47 white phosphorous bomb, loaded to release from the Number 1 position of the first station to release. The mixed industrial and residential areas were considered susceptible to destruction by this bomb load.

1. The M47 type white phosphorous bombs were to be equipped with a M18 burster to give maximum incendiary and anti-personnel effect, as well as an increased time for smoke to be generated. The latter action was to occur immediately after impact, resulting in burst approximately 4 feet beneath roofs. These bombs were to be loaded first as the trail is less, resulting in greater range than for incendiaries and thus placing the white phosphorous bomb bursts within the incendiary pattern. Based on results of previous attacks by this Command when M47 incendiary bombs and clusters of M69 bombs were used against similarly constructed targets, an average density of approximately 200 tons per square mile on the target area would effect required destruction.

2. Considerations for use of the M47 100-pound white phosphorous bombs were as follows:

a. The expected anti-personnel effect from burning particles should increase the possibility of large size fires developing from the incendiary bombs dropped.

b. A possible decrease of flak damage in the early stages of attack was expected due to smoke that would be produced.

c. The incendiary effect of white phosphorous bombs against light structures would not be appreciably reduced from that of incendiary bombs , and could conceivably be increased because fire fighting of the white phosphorous bomb would be very difficult.

d. Though the white phosphorous bomb weighs 127 pounds against 70 pounds for the M47 incendiary bomb, the bomb load would remain the same since the load of M47 incendiary bombs was limited by space.

3. Fuzing and Intervalometer Setting:

a. M47 incendiary bombs--Instantaneous nose and 75 feet intervalometer setting.

b. Clusters--Set to open at 5000 feet above target, with 50 feet intervalometer setting.

c. M47 White Phosphorous--instantaneous nose.

d. The selected fuzings had proven satisfactory on previous similar missions, and the intervalometer setting was chosen as the most efficient for obtaining a uniform density throughout the target area.

(b) Hitachi Urban Area: It was planned to have 2 Groups on this mission carry M47 incendiary bombs and 2 Groups carry M17 incendiary clusters. In the event that M17 incendiary clusters would not be available, clusters containing M69 bombs were authorized to be substituted.

1. Later, at the request of 73rd Wing, and after satisfactory dropping characteristic tests had been accomplished, authority was given to use 50 per cent of M47's and the other 50 per cent either E46 or M17 clusters. This would equalize take-off weight of all planes and it was expected that flight characteristics would be improved. The mixed residential and industrial construction within the target area was considered susceptible to attack by these weapons since light to moderate penetration was required and numerous fire divisions would have multiple hits. It was estimated that a uniform density of 225 tons per square mile on the target would effect the required destruction.

2. Fuzing and Intervalometer Setting: M47 Incendiary Bombs--instantaneous nose. M17 Incendiary Clusters--To open at 5000 feet above the target. The intervalometer setting was to be 75 feet for bombs and 50 feet for clusters. The fuzing and intervalometer setting selected was considered most desirable to obtain uniform density, proper penetration, and maximum tonnage on the target area.

(c) Chosi Urban Area: Since several industries were located in the target area, the construction of which necessitated moderate penetration, AN-M17A1 clusters were originally selected, but because of supply limitations, an alternate load of E46 incendiary clusters was chosen. The first 12 aircraft scheduled to strike the target were designated as pathfinders and were to be loaded with M47 bombs, as it was thought that first line fire defenses would be ineffective against this large bomb. Sufficient appliance fires would be developed to saturate the defenses, enabling more effective use of clusters as the main weapon. Two T4E4 fragmentation clusters were to be released last from each plane, forming a coextensive pattern with the incendiaries. The estimated density of incendiary bombs was to be the same as that for Mission Number 278.

1. Fuzing and Intervalometer Setting:

a. Twelve pathfinders were to carry M47 incendiary bombs with an instantaneous nose and intervalometer setting of 50 feet.

b. The main force was to carry E46 incendiary clusters, containing M69 bombs set to open at 5000 feet, with an intervalometer setting of 35 feet. Each aircraft in the main force also was to carry 2 500-pound fragmentation clusters set to open at 1000 feet below the aircraft, and loaded to be released last.

c. Fuzings and intervalometer settings specified were selected for same reasons as those listed for Mission Number 278.

(d) Okazaki Urban Area: The target area was highly congested and inflammable and was believed to be susceptible to the rapid fire-setting properties of the 2 types of napalm bombs specified. The estimated density of incendiary bombs was to be the same as that for Missions Number 278 and 279.

1. Fuzing and Intervalometer Setting:

a. Two Groups were to carry M47 incendiary bombs with an instantaneous nose. The intervalometer setting was to be 75 feet.

b. Two Groups were to carry E46 incendiary clusters set to open at 5000 feet above the target. The intervalometer setting was to be 50 feet.

c. The intervalometer setting was selected to give maximum concentration over the entire target, uniform coverage, and optimuin density within each plane pattern.

(e) Nippon Oil Refinery: This target consisted of 2 types of installations, refinery units and tank storage units, clustered in 2 separate areas. The building installations were single-story and small, requiring the multiple number of hits obtained by use of 500-pound general purpose bombs selected. Direct hits were expected to destroy or seriously damage installations.

1. Fuzing:

a. The non-delay nose fuze was selected as an assurance fuse only.

b. The .025 second delay nose fuzing was expected to allow penetration of the bomb beneath the tank tops to a sufficient depth to assure detonation below the contents level, resulting in maximum damage.

(2) Bomb Loading: No maximum or minimum bomb loads were specified. Bomb loads were planned as follows:

Wing	Potential Capacity (Pounds)	Expected Average (Pounds)
58th	17,000	16,000
73rd	17,000	15,000
313th	18,000	17,000
314th	18,000	15,000
315th	20,000	18,000

(3) Ammunition Loading: Ammunition was to be loaded according to SOP for night missions.

(4) Gasoline Loading: Fuel reserve data indicated that all Wings would require no bomb bay tanks and a total fuel load of approximately 6,600 gallons would be carried, unless inclement weather required large fuel reserves.

e. Flight Planning:

(1) Routes:

(a) Mission Number 277 - Fukui Urban Area:

Base to Iwo Jima to	Tactical Doctrine
3335N - 13558E to	Ino Hano, the easily identified point east of Kinomoto, was chosen as landfall.
352630N - 13609E (IP) to	An excellent radar point, located on a peninsula on northern edge of Biwa Lake, and easily identified for a good bomb run was specified as the initial point.
Target to	A right turn was specified.
3438N - 13805E to	This point was designated as land's end to avoid flak areas.
Iwo Jima to Base	Tactical Doctrine

(b) Mission Number 278 - Hitachi Urban Area:

Base to Iwo Jima to	Tactical Doctrine
3530N - 14026E to	This was selected as landfall, on the eastern shore of the peninsula between Chosi Point and Taito Saki, to keep aircraft inside flak defenses at Chosi.
3556N - 1402830E (IP) to	This excellent radar check point on the lower shore of Kasumiga Lake was chosen as initial point.
Target to	A right turn was specified off the target.
3545N - 14105E to	This dead reckoning point was selected to keep aircraft away from flak defenses at Chosi.
Iwo Jima to Base	Tactical Doctrine.

(c) Mission Number 279 - Chosi Urban Area:

Base to Iwo Jima to	Tactical Doctrine.
3352N - 13936E to	Landfall point was to be Mikura Jima, a good navigation check before entering the target area.
351030N - 1402230E(IP) to	This point on the prominent coastal projection at Taito Saki, leading out from Tokyo, would make a good radar initial point.
Target to	A right turn was specified off the target.
Iwo Jima to Base	Tactical Doctrine.

(d) Mission Number 280 - Okazaki Urban Area:

Base to Iwo Jima to	Tactical Doctrine.

341630N - 13654E (IP) to	Nakiri Point, on the approach to Ise Wan, is a very good radar initial point and was also to be the landfall point.
Target to	A right turn was specified off the target.
3455N - 13750E to	This dead reckoning point was designated to keep aircraft away from the heavy defenses at Hamamatsu.
Iwo Jima to Base	Tactical Doctrine.

(e) Mission Number 281 - Nippon Oil Refinery:

Base to Iwo Jima to	Tactical Doctrine.
3350N - 13445E to	Landfall point was to be this prominent peninsula, on the east coast of Shikoku, making a good radar check just before entering Osaka area.
341530N - 13504E (IP) to	This was a very good radar initial point at the top of Nada peninsula, at a point 1 mile southwest of Koda.
Target to	
3453N - 13526E to	This dead reckoning point was selected to get aircraft away from flak defenses in the shortest time.
3407N - 13618E to	A right turn was to be made to this point--land's end.
Iwo Jima to Base	Tactical Doctrine.

(2) Navigational and Radar Factors:

(a) Fukui is an inland city where radar navigation might be difficult due to surrounding hills and poor city return. Iwo Jima would be the only radar check point between the base and the Empire.

(b) Hitachi is a coastal city that should not be difficult to identify. The route between Iwo Jima and landfall was along the island chain, giving good check points for radar navigation and radar wind runs.

(c) Chosi was expected to be easy to locate by radar, because it is located on the prominent point on the eastern coast of Honshu, east of Tokyo. The wide river, running through Chosi Point, should be an excellent aid. As in Mission Number 278, the route was to pass along the island chain between Iwo Jima and the mainland, affording good check points for course, ground speed, and wind. The southern coast of Chosi Point is made up of rocky cliffs, which were expected to give a constant radar return for offset bombing.

(d) Okazaki was a fairly difficult inland radar target, with the only radar check point en route being Iwo Jima. The initial point and landfall, on approach to Ise Wan, should be very distinctive due to the land-water contrast, with numerous outstanding peninsulas. The radar wind ship was SOP on all radar night strikes and was expected to be of great value on this mission.

(e) The Nippon Oil Refinery is an excellent radar target because it is located on a prominent projection of land which extends into Osaka Bay and is bounded by water, on 3 sides giving a distinctive radar return. The only radar check point, enroute to landfall was Iwo Jima. The landfall point was to be a prominent peninsula on the east coast of Shikoku, and was very easy to recognize on

the APQ-7. The best point of making the radar wind run appeared to be the small island of Bento.

(3) RCM Factors:

(a) It was planned to have 2 special jamming airplanes for Mission Number 279 (Chosi), because of the flak and searchlights in the Chosi Area. The regions of 72 to 84 and 190 to 210 megacycles were to be barrage jammed and spot jamming was to be employed against gun-laying or searchlight radars appearing outside the barrage.

(b) Special RCM airplanes were not recommended for Missions Number 277, 278 and 280, but all strike planes were to be equipped with electronic jammers, tuned to barrage the 72 to 84 and 190 to 220 megacycle regions.

(c) Search of enemy radars from 20 to 3000 megacycles was to be continued, and enemy communications were to be recorded. Rope was to be carried in each airplane to be dispensed when protection would be needed from radar-controlled flak and searchlights.

(d) The 315th Wing airplanes, on Mission Number 281, lacked RCM equipment; therefore, no search and jamming could be accomplished.

(4) Flak Factors:

(a) Fukui: Photography of the Fukui area revealed no antiaircraft defenses. Only meager and inaccurate fire was expected at 12,000 ft in the Biwa Lake Area and near Tsuruga. A breakaway to the right to avoid flak areas was specified.

(b) Hitachi: The defenses at this target would be: 10 heavy and 24 medium antiaircraft guns and no searchlights, although there were estimates of 1 to 6 searchlights. Due to the very meager defense against night attack, flak was no major factor in planning. The route was planned to avoid other flak areas and an altitude of 12,000 feet was specified.

(c) Chosi: The B-29's would be in range of the following defenses on the planned axis of attack: 16 heavy and 25 medium antiaircraft guns and 4 searchlights. A base altitude of 10,000 feet was specified and the axis of attack was planned to avoid a concentration of 12 heavy guns and 55 medium weapons at Katuri Air Field (west of Chosi).

(d) Okazaki: Photographs of the Okazaki area disclosed no defenses. A base altitude of 14,000 feet was selected and the route was planned to avoid the defenses of Ujiyamada, Toyohashi and Hamamatsu.

(e) Nippon Oil Refinery: On the planned approach to this target aircraft would be in range of the following defenses: 88 heavy antiaircraft guns and 45 searchlights. It was planned to attack from the southwest, primarily over water to avoid concentrations of flak in the Osaka area. The planned altitude of attack was to be 15,000 feet, with a breakaway to the right, between the Kyoto and Osaka defenses.

(5) Assembly Points: Bombing was to be done by individual aircraft, with no assemblies to be effected.

(6) Initial Points: As listed under Routes, (1) of this section.

(7) Routes Back: As listed under Routes, (1) of this section.

f. Bombing Factors:

(1) Bombing Altitudes: Altitudes chosen depended on flak and also on the best radar returns.

(a) Fukui: 12,000 to 12,800 feet.

(b) Hitachi: 12,000 to 12,800 feet.

(c) Chosi: 10,000 to 10,800 feet.

(d) Okazaki: 14,000 to 15,400 feet.

(e) Nippon Oil Refinery: 15,000 to 16,000 feet.

(2) Axes of Attack: The axes of attack were selected to give maximum bombing accuracy in the target areas, the best possible radar scope returns and the least possible interference from flak.

(a) Fukui: 6 degrees True.

(b) Hitachi: 11 degrees True.

(c) Chosi: 360 degrees True.

(d) Okazaki: 18 degrees True.

(e) Nippon Oil Refinery: 297 degrees True.

(3) Mean Points of Impact: These were to vary with each target and determination would be dependent upon the shape of target and the density of the proposed bomb pattern. (See Layout of Mean Points of Impact, Annex A, Part II.)

(a) Fukui: A mean point of impact was selected a short distance northwest of the castle grounds. A probable circular error of 4000 feet included nearly all of the city.

(b) Hitachi: The mean point of impact selected was near the north central section of the city, with a probable circular error of 4000 feet including the major portion of the city and many of the smaller factories on the periphery of the city.

(c) Chosi: A mean point of impact was selected on [illegible] factory adjacent to the railroad yards, with a probable circular error of 4000 feet including most of the city.

(d) Okazaki: A mean point of impact was selected near the center of the city, with a probable circular error of 4000 feet including nearly all of the city.

(e) Nippon Oil Refinery: The mean point of impact selected was near the refining units, with a probable circular error of 1000 feet including all the installations except the large storage area.

(f) On Missions Number 277, 278, 279 and 280 (Fukui, Okazaki, Chosi and Hitachi), 12 pathfinder aircraft were scheduled to precede the main forces to the target areas to mark the mean points of impact.

(4) Other Bombing Factors: Factors such as flak, weather, and bombing accuracy were considered and the following other pertinent bombing data was taken into consideration in planning the missions:

Mission	Length of Run (Miles)	Time of Run (Minutes)	Drift (Degrees Right)
277	43	10	6
278	47	10 3/4	7
279	43	10 1/4	8
280	50	11	8
281	31	5	6

g. Defensive Tactics:

(1) Enemy Fighter Opposition:

(a) Fukui: It was estimated that the enemy might dispatch 5 to 15 fighters against this strike. There should be no opposition in the last half of the run from landfall to initial point, over the target, or on the return route, since enemy fighters were reported to be located near Nagoya.

(b) Hitachi: The enemy might offer negligible to weak opposition, but probably would not be able to send up over 15 to 20 fighters, of which 5 to 10 might be twin-engine.

(c) Chosi: Even though 15 to 20 enemy fighters might be airborne along the Chosi peninsula, the over-water route should practically eliminate enemy opposition.

(d) Okazaki: Interception should be negligible on this strike, even though 10 to 15 enemy fighters might be airborne.

(e) Nippon Oil Refinery: The Japanese might succeed in making interception with 15 to 20 fighters, and attacks may occur from the initial point to the target and immediately after bombs away. However, night fighters may not exceed 5 to 8 and the enemy's night fighting tactics has not proven to be effective.

(f) For all missions, it was assumed that the Japanese radar would disclose the heading of the B-29's sufficiently in advance to permit spotter planes to meet the B-29's from 50 to 150 miles from landfall. However, cloud cover should hinder these efforts by the enemy.

(2) Fighter Escort: Fighter escort was not required on these missions.

(3) Coordination of Attacks: Mining Mission Number 276, which is covered in a special Tactical Mission Report, was to be simultaneously executed with these missions.

(4) RCM: (See (3) under c. Flight Planning.)

(5) Against Enemy Aircraft:

(a) Gunnery: The SOP established for all night missions was to be the same.

i. Air-Sea Rescue:

(1) Naval: The Navy was furnished the details of the missions and was to provide the air-sea rescue facilities indicated on the chart in Annex A, Part VIII.

(2) Army Air Forces: Positions of the Twentieth Air Force Super-Dumbos were planned, as shown on the Chart in Annex A, Part VIII.

3. EXECUTION OF MISSIONS: (For specialist reports on these missions, see various Annexes that follow this narrative.)

a. Take-Off: Take-off was accomplished as follows:

Mission Number	Wing	Pathfinders Airborne	Main Force Airborne	First Take-Off	Last Take-Off
277	58th	12	118	190700Z	190843Z
278	73rd	12	118	190735Z	190847Z
279	313th	12	85	190901Z	190958Z
280	314th	12	118	190906Z	191022Z
281	315th	0	84	190730Z	190814Z
Twentieth Air Force		48	523*	190700Z	191022Z

* Six wind run, 4 super dumbo, 2 RCM and 1 radar wind run aircraft are not included in this total.

b. Route Out: Routes were flown as briefed, with the exception of 4 aircraft with landfall errors of 20 to 30 miles. No aircraft failed to bomb the primary target because of navigational error.

c. Targets:

(1) Primary: A total of 556 aircraft (including 3 on other type missions) dropped 4173.2 tons of bombs between 191344Z and 191710Z at altitudes ranging from 10,200 to 16,900 feet, with 175 bombing visually, 13 by radar with visual corrections, and 368 by radar. (For a breakdown of tonnage on the separate targets, see Annex E, Consolidated Statistical Summary.)

(2) Targets of Opportunity: Five aircraft including 2 which also bombed primary targets, dropped 26 tons of bombs, from 191250Z to 191655Z, at altitudes ranging from 8700 to 10,500 feet.

(3) Remainder of Force: Fifteen aircraft were non-effective.

d. Route Back: Routes, on return, were flown as briefed, with the exception of 25 aircraft which landed at Iwo Jima.

e. Landing: Aircraft landed at bases as follows:

Mission Number	Wing	First Landing	Last Landing
277	58th	192111Z	192310Z
278	73rd	192036Z	192302Z
279	313th	192109Z	192355Z
280	314th	192238Z	200040Z
281	315th	192119Z	192229Z
Twentieth Air Force		192036Z	200040Z

f. Loss and Damage to Aircraft:

(1) To Enemy Aircraft: None lost or damaged.

(2) To Enemy Antiaircraft: Two B-29's received minor damage.

(3) Other Reasons: Two B-29's were lost; 1 when it lost 2 engines and ditched shortly after take-off because electrical system failed, and the other is missing to unknown reasons. Four other aircraft received minor damage because of accidental, mechanical and other reasons.

g. Execution vs. Planning: The only changes from original plan were in altitude increases to and from targets due to differences from the weather forecast.

4. RESULTS OF MISSIONS: (See Annex D, Part III, for damage assessment.)

a. Fukui: Of 1.9 square miles of built-up area, 1.6 square miles (84.8 per cent) were destroyed. Damage outside of the built-up area (within a 5-mile radius of center of city) totalled .14 square mile.

b. Hitachi: Of 1.38 square miles of built-up area, .88 of a square mile (64.5 per cent) was destroyed. Destruction outside of built-up area totalled .1 square mile.

c. Chosi: Of 1.12 square miles of built-up area, .379 of a square mile (33.8 per cent) was destroyed. Several small areas outside of the built-up area were damaged.

d. Okazaki: Of .95 square mile of built-up area, .65 square mile (68 per cent) was destroyed. Damage outside the built-up area (within a 5-mile radius of center of city), totalled .03 square mile.

e. Nippon Oil Refinery: Serious damage was inflicted in the tank farm area. Twenty-five per cent of the capacity was destroyed; tankage in the target area was 39 per cent damaged; and other damage included 6 gasometers, purification buildings, gas converters, refinery and miscellaneous installations.

Curtis E. LeMay
CURTIS E. LeMAY
Major General, U.S.A.
Commanding

ANNEX

A

OPERATIONS

Part I - Navigation Report and Chart

Part II - Mean Points of Impact

Part III - Radar Approach Charts

Part IV - Bombing

Part V - Flight Engineering Report and Chart

Part VI - Radar

Part VII - Gunnery

Part VIII - Air-Sea Rescue Chart

Missions No. 277 through 281

19/20 July 1945

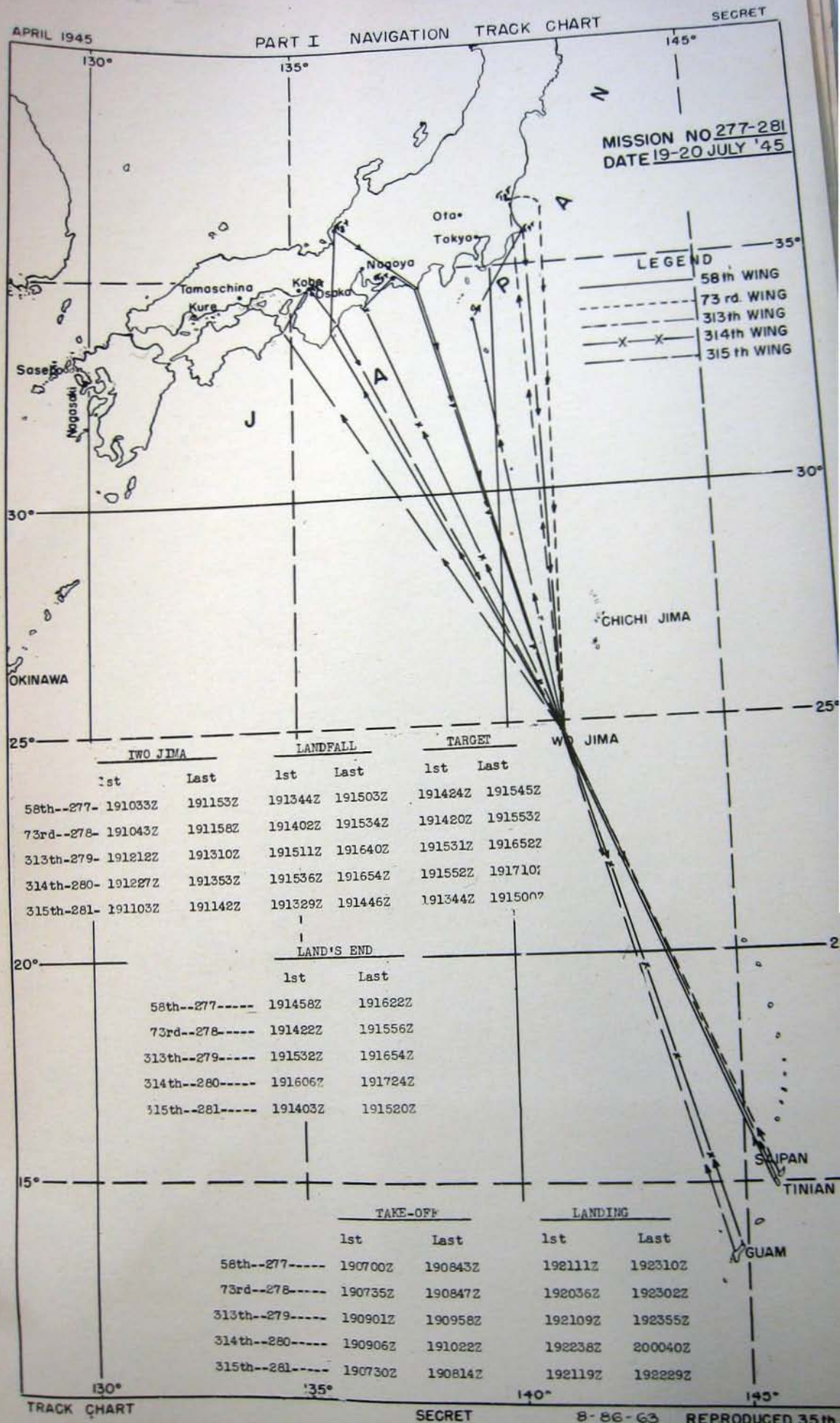
PART I - NAVIGATION

1. Long range navigation was accomplished by individual aircraft proceeding to the urban areas of Fukui (58th Wing), Hitachi (73rd Wing), Choshi (313th Wing), and Okazaki (314th Wing) and to the precision target of the Nippon Oil Refinery at Amagasaki (315th Wing). Routes were flown as briefed with the exception of four aircraft with landfall errors of 20 to 30 miles. No aircraft failed to bomb the primary target because of navigational error.

2. Wind determination, navigation and bombing in the target area were accomplished by radar. Winds in the target areas varied from 265 to 315 degrees at 24 to 17 knots respectively.

3. Since compression was excellent, 90% of the aircraft of the 58th Wing bombed in 70 minutes; 95% of the 73rd Wing bombed in 70 minutes; 90% of the 313th Wing bombed in 70 minutes; 90% of the 314th Wing bombed in 59 minutes; and 89% of the 315th Wing bombed in 25 minutes. The 314th Wing did an excellent job on time compression.

4. Return to base was as briefed, with the exception of 25 aircraft which landed at Iwo Jima. Navigation results on this mission were excellent.


APRIL 1945
PART I NAVIGATION TRACK CHART
SECRET
MISSION NO 277-281
DATE 19-20 JULY '45
LEGEND
58th WING
73rd WING
313th WING
314th WING
315th WING
130°
135°
145°
35°
30°
25°
20°
15°
Ota
Tokyo
Nagoya
Kobe
Osaka
Tamaschina
Kure
Sasebo
Nagasaki
JAPAN
CHICHI JIMA
OKINAWA
IWO JIMA
SAIPAN
TINIAN
GUAM
IWO JIMA
1st Last
58th--277- 191033Z 191153Z
73rd--278- 191043Z 191158Z
313th-279- 191212Z 191310Z
314th-280- 191227Z 191353Z
315th-281- 191103Z 191142Z
LANDFALL
1st Last
191344Z 191503Z
191402Z 191534Z
191511Z 191640Z
191536Z 191654Z
191329Z 191446Z
TARGET
1st Last
191424Z 191545Z
191420Z 191553Z
191531Z 191652Z
191552Z 191710Z
191344Z 191500Z
LAND'S END
1st Last
58th--277----- 191458Z 191622Z
73rd--278----- 191422Z 191556Z
313th--279----- 191532Z 191654Z
314th--280----- 191606Z 191724Z
315th--281----- 191403Z 191520Z
TAKE-OFF
1st Last
58th--277----- 190700Z 190843Z
73rd--278----- 190735Z 190847Z
313th--279----- 190901Z 190958Z
314th--280----- 190906Z 191022Z
315th--281----- 190730Z 190814Z
LANDING
1st Last
192111Z 192310Z
192036Z 192302Z
192109Z 192355Z
192238Z 200040Z
192119Z 192229Z

PART IV - BOMBING

1. Mission Number 277 - Fukui:

a. Altitudes varied from 12,400 to 14,000 feet and weather conditions were ideal, clear to three-tenths undercast. Bombing was accomplished visually by almost all aircraft. Thermals were strong and caused some difficulty, but occurred after bombs were released.

b. The mission was considered excellently planned. The average drift reported was 6 degrees right and the compressibility for the Wing was 81 minutes.

2. Mission Number 278 - Hitachi:

a. The attack was executed at night by single aircraft. Weather in the target area was ten-tenths undercast, which prevented any visual corrections and bombing was accomplished entirely by radar.

b. The mission was considered as well planned. The average drift reported was 4 degrees right and the compressibility for the Wing was 83 minutes.

3. Mission Number 279 - Chosi:

a. Weather in the target area was clear. The attack was accomplished by single aircraft at altitudes varying from 10,200 to 11,400 feet. Bombing was accomplished by radar except for 1 aircraft that bombed visually when the radar set became inoperative.

b. The mission was accomplished as briefed with no unusual difficulties encountered. Compressibility for the Wing was 81 minutes.

4. Mission Number 280 - Okazaki:

a. The weather in the target area was nine to ten-tenths undercast. The attack was accomplished by single aircraft at altitudes varying from 12,700 to 16,300 feet, with bombing being accomplished by radar and visual means. Fifty-four aircraft bombed visually, 10 aircraft bombed by making radar runs and with visual corrections, and 63 aircraft bombed entirely by radar.

b. The mission was considered well planned, with undercast in the target area being the greatest difficulty encountered. The average drift reported was 7 degrees right and compressibility for the Wing was 78 minutes.

5. Mission Number 281 - Nippon Oil Refinery:

a. Bombing was accomplished by single aircraft, with altitudes varying from 15,410 to 16,900 feet. Three aircraft made radar approaches with visual corrections, and 80 aircraft made radar releases.

b. Two aircraft reported malfunction of bomb racks and 1 aircraft reported malfunction of B-10 shackles. No other difficulties were encountered. The average drift reported was 4 degrees right and compressibility for the Wing was 40 minutes.

PART V - FLIGHT ENGINEERING

1. Narrative of Missions as Flown:

a. Cruise to the Mainland: Individual climbs were made immediately after take off to altitudes between 6000 and 9000 feet where the initial cruise was flown. No assemblies were made. Compression of the forces was effected by varying altitudes and air speeds.

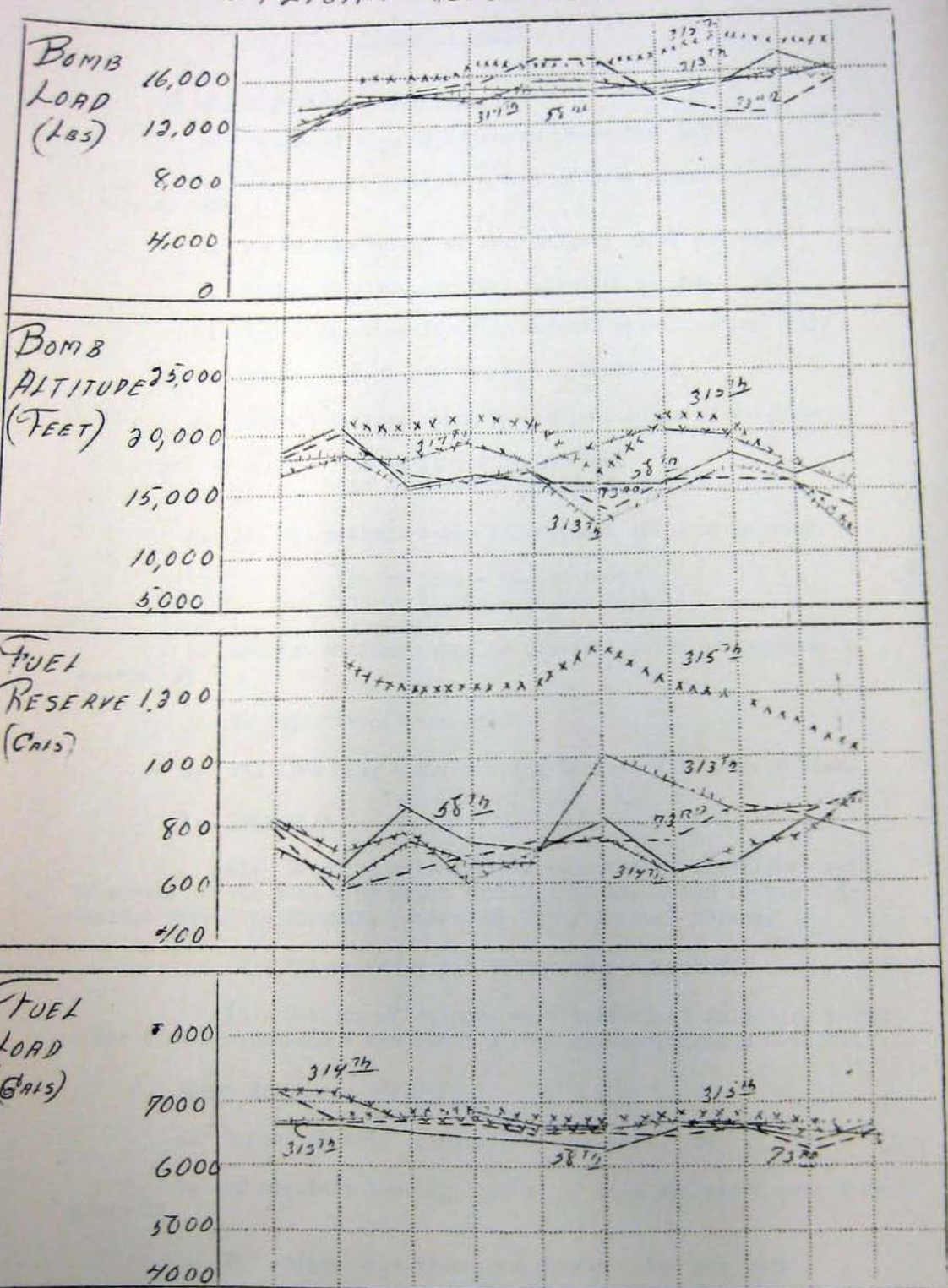
b. Bomb Run: Bombing was conducted by individual aircraft at altitudes between 10,000 and 17,000 feet.

c. Return to Base: Return to the base was conducted without difficulty by individual aircraft. Minimum fuel was used by airplanes cruising at 14,000 to 16,000 feet and descending 250 feet per minute into the traffic pattern. Maximum range speeds as specified by this headquarters gave the best fuel consumption.

2. Comments: No airplanes carried bomb bay tanks. All wings carried 99% to 100% bomb bay capacity, except the 315th Wing which carried an average of 82% bomb bay capacity.

3. Exhibits: For historical record see chart that follows this page.

FLIGHT ENGINEERING



PART VI - RADAR

1. Radar Bombing - AN/APQ-13:

a. Number of sets operative on take-off: 477

b. Of aircraft bombing, number of sets operative over target: 459

c. Percentage operative over target: 97.5 per cent

d. Number of sets operative on return to base: 449

e. Number of aircraft using azimuth stabilization: 357

f. Number of failures in lead aircraft: 5

g. Average maximum range in nautical miles of targets:

77 at 5000 - 10,000 feet
68 at 10,000 - 15,000 feet

h. Average maximum range in nautical miles of beacons:

116 at 5000 - 10,000 feet
136 at 10,000 - 15,000 feet

i. Average maximum range in nautical miles of Japanese coast: 59

j. No interference was noted.

k. The 73rd Wing had recurring trouble with wave guides.

l. Comments:

(1) Briefing material was reported as excellent, with exception of the 58th Wing which stated that the litho lacked sufficient detail to identify positively the reference points.

(2) Target stood out better than expected.

(3) Methods of release were individual releases, using radar direct synchronous and radar direct non-synchronous methods.

2. Radar Bombing - AN/APQ-7:

a. Number of sets operative on take-off: 84

b. Of aircraft bombing, number of sets operative over target: 83

c. Percentage operative over target: 100 per cent

d. Number of sets operative on return to base: 83

e. Average maximum range in nautical miles of target:

65 at 15,000 feet

f. Average maximum range in nautical miles of beacons:

115 at 10,000 feet

g. Interference: Other sets in target area.

h. Coast of Japan picked up at 65 nautical miles.

i. Equipment failures: 1

j. Recurring failures:

(1) No beacon reception.

(2) Camera malfunction.

k. Eighty-three aircraft made direct synchronous releases, while only 1 aircraft made a combination radar-visual release.

l. Comments:

(1) Landfall and IP easily identified.

(2) Briefing very satisfactory.

(3) Aiming point easily identified.

3. Radar Navigation - APN-4 & APN-9:

a. Number of fixes reported: 6361

b. Antenna used and useable maximum range of each:

	Fixed	Trailing	Command
(1) Ground-wave:	600	637	482
(2) Sky-wave:	1267	1280	1282

c. Inoperative sets: 9

4. IFF - SCR-695:

a. Sets turned on and off as per SOP.

b. Average number of times checked: 38

c. No malfunctions were reported.

5. Absolute Altimeter - SCR-718:

a. Number of operative sets: 210

b. Number of inoperative sets: 6

6. Comments: The use of the wind-run ship was reported to be of great benefit, especially in cutting down deflection errors.

PART VII - GUNNERY

1. Number of aircraft firing: 1

2. Average turret load:

UF	UA	T	LA	LF
510	325	400 (315th Wing) 600	333	240

3. Average number of rounds fired in combat per turret:

UF	UA	T	LA	LF
0	0	16	0	0

4. Number of rounds fired in combat: 16

5. Number of rounds used for test firing: 5226

6. Guns Loaded:

58th Wing		73rd Wing		313th Wing	314th Wing
Hot		Cold		Hot	Cold

315th Wing

3 Gps Cold
1 Gp Hot

7. Malfunctions:

a. C.F.C.: None

b. Caliber .50 M.G.: Ammunition Jam

8. Total percentage of equipment operative:

a. C.F.C.: 100%

b. Caliber .50 M.G.: 99.9%

9. APG malfunctions--37. No enemy attacks were encountered. APG project still determining causes of innumerable malfunctions occurring.

1. ALL SUBMARINES AND VESSELS WERE TO BE ON STATION DURING ENTIRE MISSION.

2. ALL DUMBOS AND SUPERDUMBOS WERE TO BE ON STATION FROM TIME INDICATED TO RETURN PASSAGE OF ALL STRIKE AIRCRAFT.

CRASH BOATS ON STATION VICINITY OF COMMAND BASES DURING TAKEOFF AND LANDINGS.

ANNEX

B

WEATHER

Part I - Weather Summary

Part II - Chart--Predicted vs. Observed Weather

Part III - Prognostic Map

Part IV - Synoptic Map

Missions No. 277 through 281

19/20 July 1945

PART I - WEATHER SUMMARY

PLANNING FORECAST

Bases: 5-6/10 low clouds, base 800 ft, tops 7000 ft with frequent moderate showers and broken middle and high clouds.

Route: To 20°N: As bases.
To 30°N: 3-5/10 low clouds, base 2000 ft, tops 6000 ft with scattered high clouds.
To 32°N: 6-8/10 low clouds, base 1800 ft, top 8-10,000 ft and 7/10 middle clouds, 11-17,000 ft in layers and 8/10 high clouds. Moderate rain showers.
To Coast: 6-8/10 low clouds, base 2000 ft, tops 4-5000 ft with 4-6/10 middle clouds, 11-18,000 ft. Frontal conditions extend to coast west of Nagoya.

Targets: Tokyo and Nagoya: As last portion of route.
All Others: Frontal conditions extend to coast west of Nagoya.

OPERATIONAL FORECAST

Bases at Take-off: Broken low, middle and high clouds with scattered light showers.

Route: Scattered low and high clouds to Iwo becoming scattered low, middle and high clouds between Iwo and 30°N. From 30°N to 31°N there will be overcast low, middle and high clouds and moderate rain associated with a front.
From 31°N to Fukui and Okazaki: Overcast low and high clouds and broken middle clouds with scattered light showers.
From 31°N to Hitachi and Choshi: Broken low and middle clouds and overcast high clouds with light rain.
From 31°N to Amagasaki: There will be broken low and middle clouds and overcast high clouds with light rain.

Targets: Choshi: 8/10 low clouds, base 1000 ft, top 3000 ft; 4/10 high clouds at 31,000 ft; patchy fog. Winds at 10,000 ft will be 244°at 30 knots.
Hitachi: 8/10 low clouds, base 1000 ft, top 3000 ft; 4/10 high clouds at 31,000 ft; patchy fog. Winds at 12,000 ft will be 240° at 32 knots.
Fukui: 3/10 low clouds, base 2500 ft, top 5000 ft; 3/10 middle clouds, base 15,000 ft, top 17,000 ft; 8/10 high clouds at 30,000 ft. Winds at 13,000 ft will be 240° at 33 knots.

Bases on Return: Scattered low and middle clouds and broken high clouds with occasional scattered light showers.

OBSERVED WEATHER

Bases at Take-off: Broken low clouds and overcast middle clouds with showers reducing visibility to 6 miles.

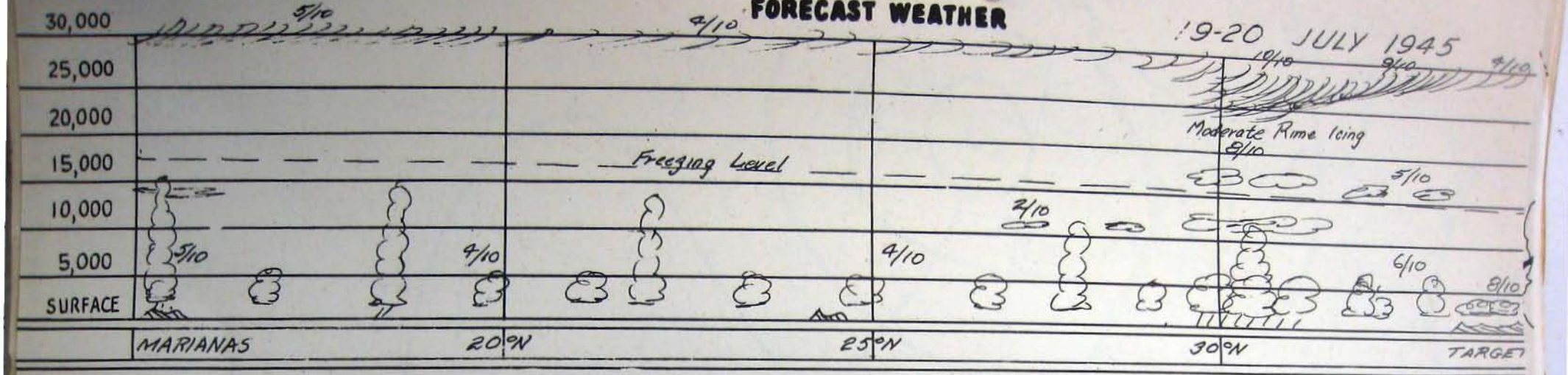
Route: Broken low clouds with some build-ups to 15,000 ft to 25,000 ft; overcast middle clouds and showers reducing ceilings to 1000 ft to 17°N. From 17°N to 28°N there were scattered low clouds with patchy middle and high clouds. Light to moderate showers and moderate turbulence in build-ups to Iwo Jima. From 27°N to 28°N there was evidence of a very weak front with broken low clouds and overcast high clouds with scattered broken middle clouds. From 28°N to 33°N there were scattered low and high clouds. From 33°N to the target areas there were scattered low and middle clouds becoming overcast at the coast. Middle clouds in this sector were in layers between 13,000 ft and 17,000 ft.

Targets: Hitachi: 9-10/10 low clouds, tops 7-8000 ft; 8-9/10 middle clouds in layers between 13,000 and 17,000 ft; visibility 5-10 miles in haze. Winds at 12,000 ft were reported at 315° at 17 knots.
Okazaki: 9-10/10 low clouds, tops 5000 ft (large hole over target--probably due to fires) 2/10 middle clouds, base 16,000 ft; visibility 10 miles. Winds at 15,000 ft were 280° at 28 knots.
Fukui: Stratus clouds were seen in the valley along the river, otherwise no low clouds reported; 6/10 middle clouds, base 16,000 ft; visibility 12 miles. Winds at 13,000 ft were 265° at 22 knots.
Choshi: 10/10 low clouds, tops 4000 ft; 10/10 middle clouds, base 13,000 ft, top 17,000 ft. Winds at 11,000 ft were 300° at 20 knots.
Nippon Oil Refinery - Amagasaki: 7/10 low clouds, tops 6000 ft; 5-8/10 middle clouds, base 15,000 ft, tops 16,000 ft; scattered high clouds at 28,000 ft. Winds at 15,000 ft were 260° at 30 knots.

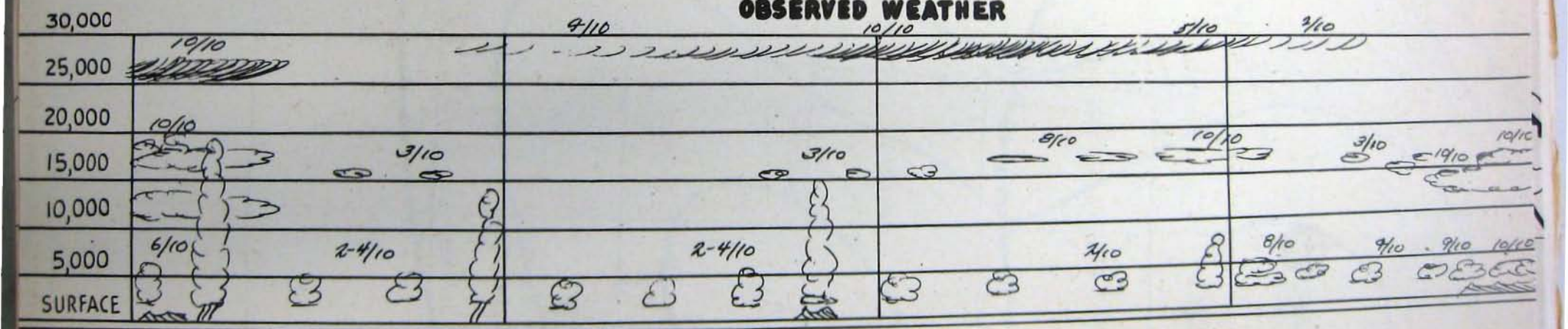
MISSIONS 277, 278, 279, 280 & 281

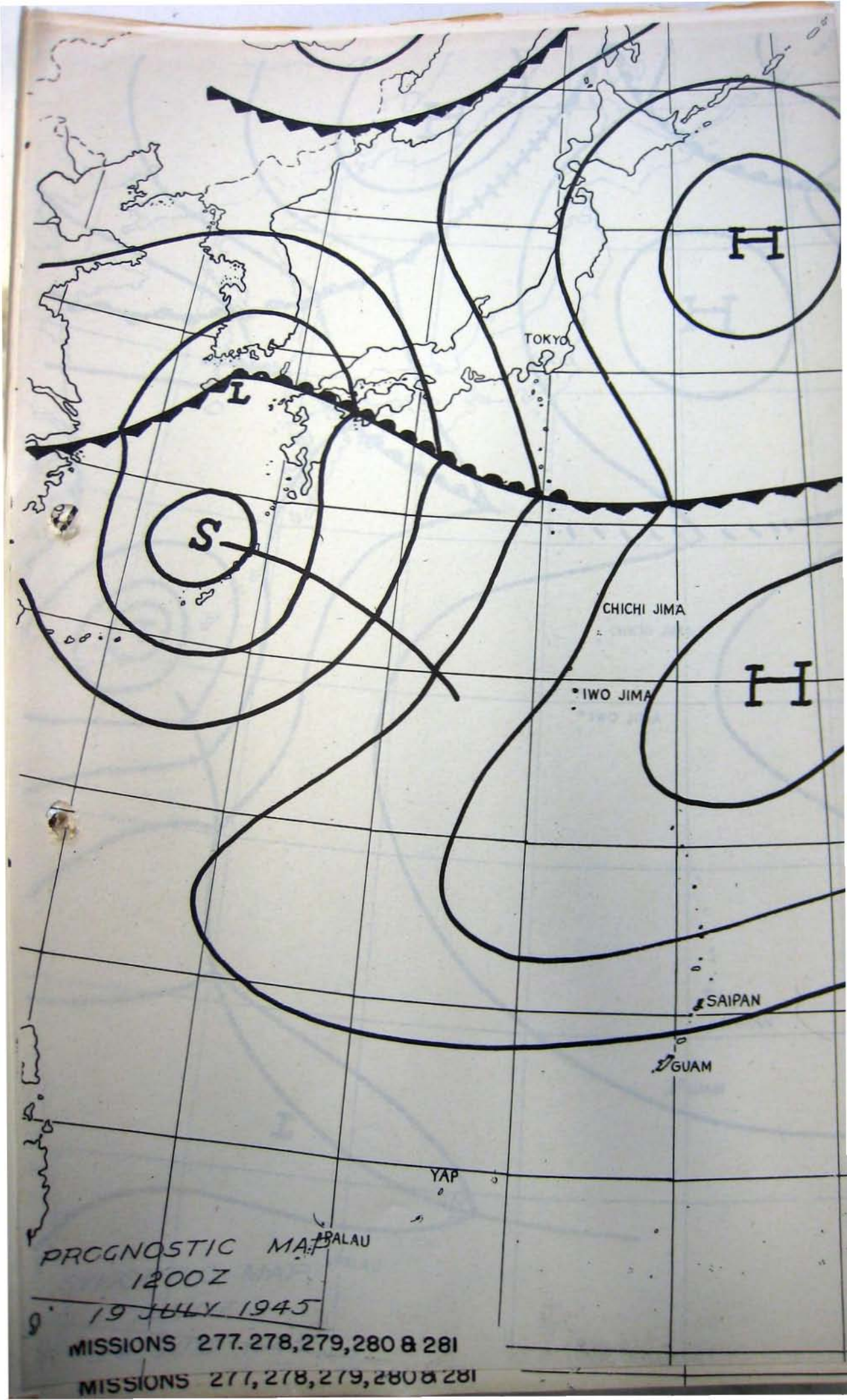
FORECAST WEATHER

19-20 JULY 1945

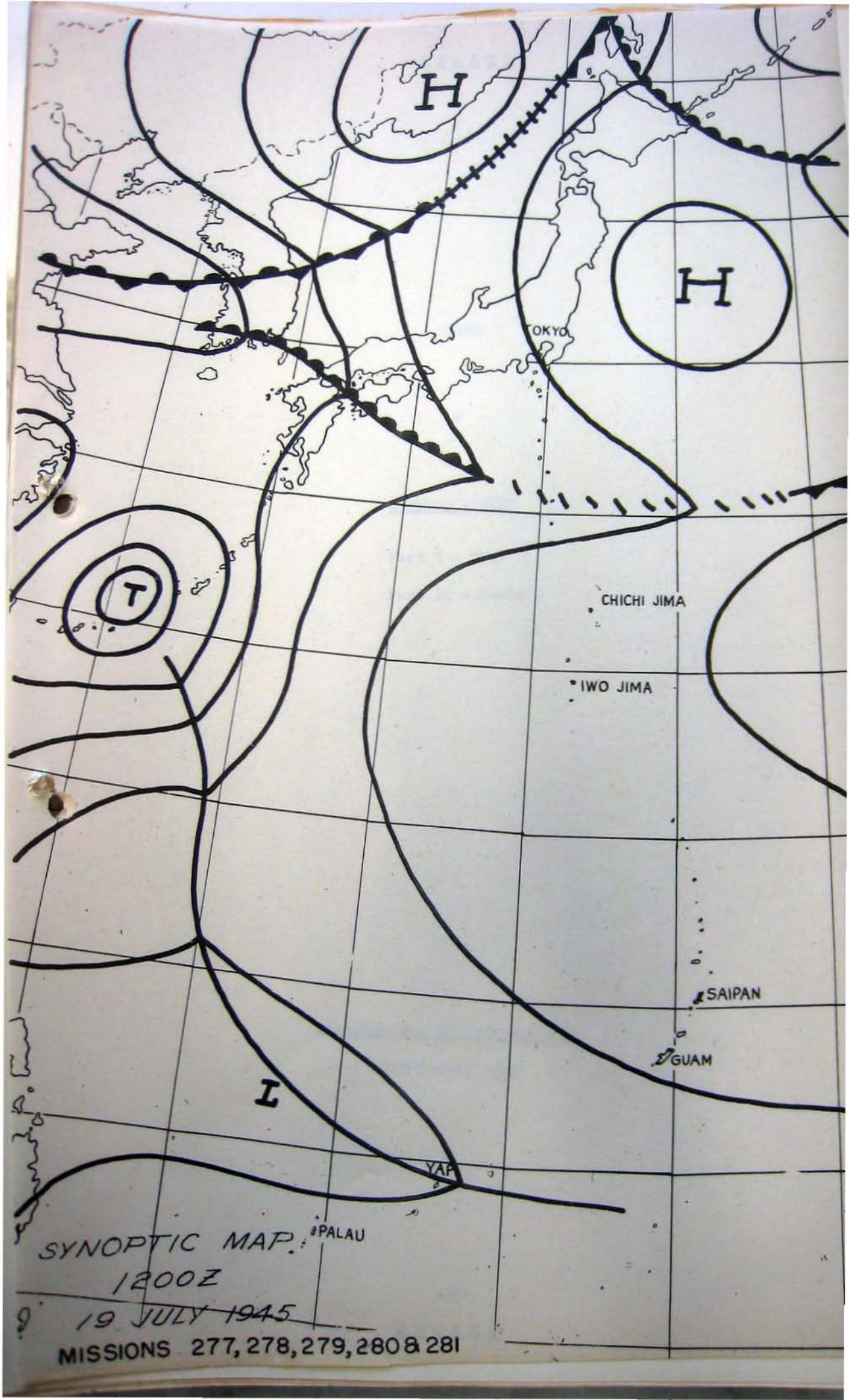


OBSERVED WEATHER





PROGNOSTIC MAP
1200Z
19 JULY 1945
MISSIONS 277.278,279,280 & 281
MISSIONS 277,278,279,280 & 281



SYNOPTIC MAP.
1200Z
19 JULY 1945
MISSIONS 277, 278, 279, 280 & 281

ANNEX

C

COMMUNICATIONS

Part I - RCM

Part II - Radio

Missions No. 277 through 281

19/20 July 1945

PART I - RCM

1. Purpose:

a. To D/F enemy radars.

b. To conduct a general search in the 20-3000 mc regions.

c. To barrage jam enemy gun-laying and searchlight radars in the 72-84 and 190-210 mc regions and to spot jam any gun-laying or searchlight radars appearing outside the barrage.

d. To confuse enemy radar defenses by the use of rope.

e. To search and record enemy voice communications.

2. Method:

a. Thirty-eight RCM observers participated and used the following equipment to accomplish the search and jamming: 313 - APT-1, 160 - APQ-2, 15 - ARQ-8, 20 - APT-3 (Modified), 38 - APA-24, 18 - APA-11, 8 - APA-24, 2 - ARR-7, 2 - APR-5, 1 - ANQ-1, 1 - ANQ-2 and 7 - APA-6.

b. Rope was dispensed at the rate of 3 bundles per 10 seconds when protection was needed from searchlights.

c. Two special jamming airplanes were employed by the 313th Wing, target Choshi, to circle the target area during the strike. These airplanes were equipped to spot and barrage jam the enemy radar controlled flak and searchlights.

d. All strike aircraft except those of the 315th Wing were equipped with 1 or more electronic jammers.

3. Results:

a. Eighty-four intercepts were recorded and are listed at the end of this section. Nineteen of these signals are identified as gun-laying or searchlight radars.

b. The special jamming aircraft appeared successful. The searchlights and gun-laying radar bands were completely jammed and those outside the barrage limits were spot jammed. Some of the radars ceased operation after being jammed.

c. Japanese voice communications were intercepted on the following frequencies, 4.6 mc, 4.745 mc, 4.81 mc, 4.93 mc.

d. Two signals with the characteristics 198/3800/03, 203/4217/03 were intercepted and are believed to be the TA Model 4 radar.

4. Remarks: The following unusual signals were intercepted: 280/?/10, 300/?/?, 49/537/45, 49/300/?, 3100/1500/01.

00049	0537	45	3310N	14110E	072045	0200	21	121	S	
00049	0300	00	3400N	13703E	072045	0216	21	121	S	
00069	0000	40	3230N	14110E	072045	0210	21	121	S	[illegible] CHI
00072	0410	00	3406N	13805E	072045	0258	21	121	S	[illegible] CHI
00074	0485	28	3416N	072045	072045	0340	21	122	T	[illegible] CHI
00074	0485	40	3225N	14110E	072045	0050	21	121	S	[illegible] CHI
00074	0490	00	3450N	13745E	072045	0246	21	121	S	[illegible] CHI
00074	0750	20	3140N	14000E	072045	0134	21	121	S	[illegible] CHI
00075	0492	36	3416N	13650E	072045	0330	21	122	T	[illegible] CHI
00076	1862	06	3500N	13552E	072045	0429	21	122	T	GL OTA03
00076	0940	08	3530N	14035E	072045	0049	21	121	S	GL OTA03
00076	0192	00	3450N	13700E	072045	0124	21	121	S	[illegible] CHI
00077	1000	08	3405N	13935E	072045	0208	21	121	S	GL OTA03
00076	1000	08	3545N	14043E	072045	0210	21	121	S	GL OTA03
00077	0459	26	3440N	13632E	072045	0505	21	122	T	[illegible] CHI
00077	1250	08	3530N	14040E	072045	0205	21	121	S	GL OTA03
00078	1250	08	3500N	14015E	072045	0156	21	121	S	GL OTA03
00078	1250	08	3450N	13930E	072045	0134	21	121	S	GL OTA03
00078	1862	06	3435N	13530E	072045	0405	21	122	T	GL OTA03
00078	1200	05	3620N	14030E	072045	0042	21	121	S	GL OTA03
00079	0461	00	3430N	13700E	072045	0219	21	121	S	[illegible] CHI
00080	1862	06	3500N	13552E	072045	0452	21	122	T	GL OTA03
00080	0470	36	3306N	13948E	072045	0530	21	122	T	[illegible] CHI
00080	0900	00	3440N	13710E	072045	0240	21	121	S	[illegible] CHI
00080	1200	05	3547N	14035E	072045	0145	21	121	S	GL OTA03
00081	0485	34	3145N	14045E	071945	2300	21	121	S	[illegible] CHI
00081	0500	50	3130N	14000E	072045	0133	21	121	S	[illegible] CHI
00083	0497	26	3330N	13545E	072045	0313	21	122	T	[illegible] CHI
00090	0368	32	2639N	14209E	072045	2155	21	122	T	[illegible] 001010202
00092	0000	30	2855N	14050E	071945	2242	21	121	S	[illegible] 001010202
00092	0750	20	3130N	14000E	072045	0132	21	121	S	[illegible] CHI
00094	0366	32	3500N	13532E	072045	0427	21	122	T	[illegible] 001010202
00094	0300	00	3500N	13715E	072045	0232	21	121	S	[illegible] 001010202
00095	0300	00	3500N	13715E	072045	0255	21	121	S	[illegible] 001010202
00096	0365	25	3437N	13852E	072045	0507	21	122	T	[illegible] 001010202
00097	0250	40	3120N	14005E	072045	0131	21	121	S	[illegible] 001010202
00103	0500	10	3400N	13650E	072045	0217	21	121	S	[illegible] 001010202
00104	0500	25	3120N	14005E	072045	0130	21	121	S	[illegible] 001010202
00106	0500	20	3120N	14005E	072045	0130	21	121	S	[illegible] 001010202
00107	0602	42	3430N	13700E	072045	0245	21	121	S	[illegible] 001010202
00109	0000	15	3430N	13700E	072045	0300	21	121	S	[illegible] 001010202
00113	0350	30	3500N	14045E	072045	0052	21	121	S	[illegible] 001010202
00115	0000	9	3330N	13645E	072045	0207	21	121	S	[illegible]
00118	0000	7	3330N	13645E	072045	0200	21	121	S	[illegible]
00119	0000	12	2620N	14110E	072045	0437	21	121	S	[illegible]
00143	0500	12	3550N	14100E	072045	0030	21	121	S	[illegible] 001030003
00144	0525	10	3545N	14100E	072045	0034	21	121	S	[illegible] 001030003
00145	0450	02	3640N	14040E	072045	0045	21	121	S	[illegible] 001030003
00147	1020	08	2630N	14028E	072045	0434	21	122	T	[illegible] 00604
00147	0500	08	3400N	13725E	072045	0310	21	122	T	[illegible] 001030003
00148	1000	03	3640N	14040E	072045	0040	21	121	S	[illegible] 00604
00150	0490	05	3640N	14040E	072045	0020	21	121	S	[illegible] 001030003
00150	1050	09	3510N	13515E	072045	0334	21	122	T	[illegible] 00604
00152	0487	04	3640N	14040E	072045	0206	21	121	S	[illegible] 001030003
00152	1000	08	3130N	14005E	072045	0127	21	121	S	[illegible] 00604
00152	0600	08	3500N	14050E	072045	0221	21	121	S	[illegible] 001030003
00153	1000	08	3210N	13845E	072045	0355	21	122	T	[illegible] 00604
00154	0500	08	3406N	14025E	072045	0112	21	121	S	[illegible] 001030003
00154	0500	04	3503N	13959E	072045	0120	21	122	T	[illegible] 001030003
00154	0500	08	3500N	14050E	072045	0221	21	121	S	[illegible] 001030003
00155	0750	05	3500N	14050E	072045	0221	21	121	S	[illegible] 001030003

00155	0450	08	3443N	13620E	072045	0324	21	122	T	T	001030003
00156	0500	05	3510N	14020E	072045	0130	21	121	S	T	001030003
00157	0500	04	3250N	14110E	072045	0210	21	121	S	T	001030003
00157	0950	08	3335N	13935E	072045	0127	21	121	S	T	00504
00157	0750	08	3500N	14050E	072045	0221	21	121	S	T	001030003
00158	0149	00	3415N	13650E	072045	0230	21	121	S	T	001030003
00158	0500	03	3537N	14037E	072045	0154	21	122	T	T	001030003
00158	0500	04	3518N	13900E	072045	0206	21	122	T	T	001030003
00160	0600	08	3530N	14050E	072045	0216	21	121	S	T	001030003
00162	0500	05	3453N	14114E	072045	0212	21	122	T	T	001030003
00186	1010	05	3400N	14100E	072045	0015	21	121	S	GL	00401
00186	1000	05	3410N	13940E	072045	0210	21	121	S	GL	00401
00190	1000	03	3548N	14035E	072045	0147	21	121	S	GL	00401
00192	0000	05	3530N	14040E	072045	0027	21	121	S	GL	00401
00198	0800	03	3600N	14035E	072045	0040	21	121	S	GL	00404
00201	0000	10	3505N	14050E	072045	0029	21	121	S		
00203	4217	03	2700N	14130E	072045	2145	21	121	S	GL	00404
00203	1000	05	3520N	14025E	072045	0135	21	121	S	GL	00401
00207	0875	00	3500N	14050E	072045	0016	21	121	S		
00209	1245	06	3450N	14050E	072045	0024	21	121	S	GL	00401
00280	0000	10	3110N	13930E	072045	0418	21	121	S		
00300	0000	00	3400N	13700E	072045	0200	21	121	S		
03100	1500	01	3600N	14025E	072045	0020	21	121	S		

PART II - RADIO

1. Strike Reports: Forty-five strike reports messages were received by the Wing Ground Stations.

2. Fox Transmissions: "F" type dummy messages were transmitted from the Wing Ground Stations to aircraft in flight on two occasions, during these missions. Results show that 87.3 per cent of all radio operators copied these messages successfully. Those not able to copy messages were off watch for various reasons, which included working on equipment malfunctions, helping navigators with Loran fixes, those who were air sick or who were eating. Interference and guarding other channels, were other reasons included for not copying messages. The operators of the 73rd Wing showed an average of 95.2%, in copying 2 messages and the 314th Wing reported that 90.4% of their operators copied 2 messages correctly. In copying these messages, the 58th Wing averaged 83 per cent while the 313th Wing averaged 80.7 per cent of operators. Weather, both terminal conditions and Iwo Jima weather, and Time Signals were other scheduled broadcasts made, on the hour and on the half hour, during these missions.

3. Frequencies: Atmospheric interference was reported as moderate, during the time of missions, with the usual amount of interference from enemy transmissions. The following was a percentage breakdown of traffic per frequency: 10.8 per cent on 3 megacycles; 45.2 per cent on 7 megacycles and 44 per cent on 11 megacycles.

4. Navigational Aids: There were 5 requests for HF/DF bearings received, and all were obtained. Three requests for VHF/DF bearings were received and all were obtained. Ranges, homers, and broadcast stations were used effectively.

5. Net Discipline and Security: There were no breaches of net discipline or of security reported.

6. Enemy Transmissions: The following incidents of enemy transmissions, jamming and interference were recorded during the time of these missions:

a. 3020 kcs:

(1) Others stations, on frequency, sending 5 number groups, each followed by "R", with varying signals at 1000Z and from 1100Z to 1600Z, were partially effective.

(2) Unidentified and meaningless CW, between 1400Z and 1900Z was ineffective.

(3) Steady CW tone, from 1615Z to 1830Z, was very effective.

b. 6615 kcs:

(1) CW, with call sign "2RB" and "BD8" and speed key sending at 0800Z to 2200Z were partially effective.

(2) CW, "6D'" V 4KB QSV HERB R AR, and speed key sending, from 1132Z to 1400Z, were ineffective to very effective.

(3) V's and unreadable CW at 1300Z, 1400Z to 1800Z and 1900Z to 2015Z, were ineffective.

c. 10305 kcs: Negligible.

d. 3145 kcs: (This has been replaced by 3160.)

e. 6055 kcs:

(1) Unintentional Jap CW between 1530Z and 1800Z, was ineffective.

(2) Enemy CW and R/T, between 1340Z and 1430Z, were partially effective.

(3) Jap CW at 1600Z and at 1830Z, was partially effective.

(4) Jap voice at 1400Z was ineffective.

f. 10880 kcs:

(1) Radio teletype signals, between 1130Z and 1300Z, were partially effective.

(2) Jap CW, between 0815Z and 1000Z, was ineffective.

g. 3990 kcs: Negligible.

h. 7415 kcs:

(1) CW hash, between 1440Z and 1936Z, was very effective.

(2) Bagpipe at 1455Z was partially effective.

(3) Various CW code letters and unrelated call signs at 1800Z were partially effective.

i. 10820 kcs: CW code and hash, at 1400Z, were partially effective.

j. 3410 kcs: Negligible.

k. 7310 kcs: Tone, from 1330Z to 1600Z, was partially effective.

l. 11160 kcs: Tone, from 1905Z to 1930Z, was effective.

m. 3810 kcs: CW and voice, between 1230Z and 1400Z, were very effective.

n. 6640 kcs: High speed CW, between 1400Z and 1600Z, was partially effective.

o. 10965 kcs: Negligible.

7. Distress: The 58th Wing recorded 4 distress messages, giving pertinent information. There was no other distress traffic.

8. Equipment Malfunctions: AN/ART-13: 1 sidetone; 1 channel 10 inoperative, 1 no output; 1 dynamotor burned out; BC-348: 16.0 to 9.5 frequency band off calibration by 200 kcs; 1 band switching mechanism inoperative; 2 inoperative; AN/ARN-7: 3 inoperative; 1 inoperative on CW and compass position; 1 needle inoperative; 2 sense antennas broken; SCR-522: 3 inoperative; 1 receiver inoperative; 1 inoperative on "REM" position; 1 would not channel; Interphone: 3 inoperative; 1 pilot's microphone inoperative; 1 jackbox leakage; 1 microphone switch inoperative; RL-42: 2 inoperative; 1 lost weight; 1 broken wire.

ANNEX

D

INTELLIGENCE

Part I - Enemy Air Opposition

Part II - Enemy Antiaircraft

Part III - Damage Assessment

Missions No. 277 through 281

19/20 July 1945

PART I - ENEMY AIR OPPOSITION

1. Summary:

a. The Japanese air force continued in its reluctant manner to oppose the B-29 night strikes with a meager force of interceptors. Only 30 to 35 enemy fighters were airborne, despite the fact that targets were located in the 2 areas where heretofore there had occurred the strongest fighter opposition.

b. The enemy made no attacks and B-29 crews made no claims.

2. Mission 277, Fukui, 58th Wing:

a. A total of 8 aircraft was seen. Two fighters acted as pacers.

b. A round white light approached 1 B-29 rapidly from behind, grew smaller and then disappeared before any outline could be distinguished.

3. Mission 278, Hitachi, 73rd Wing: With 10/10 undercast, tops 7,000 to 8,000 feet, prevailing over the target, only 1 single-engine fighter was reported (by 1 crew). The reported S/E trailed the observing aircraft at altitude (12,000 feet) 1,000 yards behind from the IP to the target area.

4. Mission 279, Choshi, 313th Wing: Three unidentified aircraft were sighted in the target area.

5. Mission 280, Okazaki, 314th Wing: Of the 9 enemy fighters encountered, 1 was at landfall, 4 between landfall and the target, 3 after bombs away and 1 was encountered at land's end. One of the aircraft sighted was firing tracers. Two others were observed with running lights on.

6. Mission 281, Amagasaki, 315th Wing:

a. A total of 15 enemy aircraft was sighted. Six passes were made by single enemy aircraft with no evidence of planned coordinated activity. All but 1 of the passes took place after bombs away to land's end. The majority of the fighters was sighted after bombs away.

b. None of the enemy aircraft sighted was recognized, but 6 were identified as twin-engine fighters and 7 as of single-engine type. One of the twin-engine enemy aircraft was said to have the appearance of a B-25; and 1 of the single-engine, the appearance of a P-47.

c. One unidentified enemy aircraft, described as having "clear blue" running light on each wing and as appearing "something like a B-25", was sighted by a B-29 before landfall was reached. The enemy aircraft approached from 2 o'clock level and broke away left and down at 100 yards. It was possible that this enemy aircraft was a radar-equipped spotter aircraft. The enemy aircraft figuring in these passes were operating singly. Significant, perhaps, is the fact that only 1 such attack was from the rear. Two of the attacks were from the right beam, 2 from 2 o'clock level, 1 from 12 o'clock high, and 1 from 5 o'clock level.

d. A "white flare" was dropped from 4,000/5,000 feet above a B-29. It fell about 300 yards from a B-29 and burned for about 30 seconds, with blobs of fire falling from it.

PART II - ENEMY ANTIAIRCRAFT

1. Mission No. 277 - Fukui Urban Area:

a. The primary target was bombed by 127 A/C of the 58th Wing between 1424Z and 1545Z from 12,400 to 14,000 feet. Axis of attack varied from 356° to 21°. Weather was reported as CAVU-3/10 cloud undercast with winds of 22 knots from 265°.

b. En route to the target flak was encountered as tabulated below:

Location	Coordinates	Remarks
Tsuruga	3539N 13603E	Meager and inaccurate, medium and heavy.
Takefu	3550N 13610E	Meager and inaccurate, heavy and medium.
Taeishi-misaki	3546N 13601E	Meager and inaccurate, medium.
Picket Boat	3220N 13632E	Meager and inaccurate, medium.

c. Over the target flak was described as meager, inaccurate, heavy and medium by approximately 47% of the A/ C bombing. The remainder reported flak as nil. A few white phosphorus bursts were observed in the target area. From 1 to 3 ineffective searchlights were observed in the target area. Several crews felt that a bomb burst pattern struck one of the lights.

d. On withdrawal flak was encountered as tabulated below:

Location	Coordinates	Remarks
Kagamigahara	3524N 13652E	Meager and inaccurate, heavy.
Tajimi	3520N 13708E	Meager and inaccurate, heavy.

e. No A/C were lost or damaged as a result of flak on this mission.

f. Miscellaneous AA Observations:

(1) A green light without a beam was reported in the target area. Several crews reported similar lights in the area east of Osaka, which produced effective illumination at the flying altitudes. The meager descriptions suggest that their observations were possibly the same mysterious green ground glows previously reported.

(2) One rocket (visible smoke trail) was observed over the target.

(3) Blackout in the target area was complete, although 6 lights were visible in Tsuruga.

2. Mission No. 278 - Hitachi Urban Area:

a. The primary target was bombed by 127 A/C of the 73rd Wing between 1420Z-1553Z from 12,200-13,650 feet. Axis of attack varied from 8° to 25°. Weather was reported as 10/10 undercast during the entire route over the Empire. Wind was 17 knots from 315°.

b. En route to the target, 4 A/C encountered meager, inaccurate, heavy and medium barrage fire at the I.P. (South tip of Kasumiya Bay).

c. Over the target flak was described as meager (scattered) inaccurate, heavy and medium by 37 A/C. One A/C reported meager, accurate and heavy flak which rocked the ship. One ineffective searchlight was observed in the target area.

d. On withdrawal flak was nil.

e. No A/C were definitely lost to or damaged by flak on this mission, although 1 A/C was lost to unknown causes.

f. One crew member observed an oval-shaped barrage balloon over the southern edge of the target. It was estimated that its diameter to be 25 feet and altitude to be 11,000 feet. Altitude of the B-29 was 12,800 feet.

3. Mission No. 279 - Chosi Urban Area:

a. The primary target was bombed by 91 A/C of the 313th Wing between 1531Z-1652Z from 10,200-11,400 feet. Axis of attack averaged 34°. Cloud cover was reported as 2/10-10/10 with winds of 20 knots from 300°.

b. En route to the target flak was encountered as tabulated below:

Location	Coordinates	Remarks
Hachioji Jima		Very meager and inaccurate, heavy.
I.P.	3510N 14024E	Very meager and inaccurate, heavy.
Picket Boat	3350N 14040E	Very meager and inaccurate, heavy.

c. Over the target flak was described as meager, inaccurate and heavy by 32 A/C. Sixty-three A/C reported medium flak as meager and very inaccurate. (1000-2000 feet low) One ineffective searchlight was observed in the target area.

d. On withdrawal flak was encountered from picket boats at 3430N - 14055E and just off Choshi Point. Fire was meager, inaccurate and heavy.

e. No A/C were lost or damaged as a result of flak on this mission.

f. One very inaccurate ground-to-air rocket was observed coming up from the target area.

4. Mission No. 280 - Okazaki Urban Area:

a. The primary target was bombed by 126 A/C of the 314th Wing between 1552Z-1710Z from 12,700-16,300 feet. Axis of attack varied from 0° to 35°. Weather consisted of 8/10-10/10 undercast with winds of 28 knots from 279°.

b. En route to the target flak was nil.

c. Over the target area flak was described as meager, inaccurate and medium by 57 A/C. Heavy flak was described as very meager and inaccurate. One or 2 ineffective searchlights were observed in the target area.

d. On withdrawal very meager and inaccurate heavy flak was encountered at Hamamatsu. Meager and inaccurate medium flak was encountered at Omae-saki (land's end) and Toyohashi.

e. No A/C were lost or damaged as a result of flak on this mission.

f. Other searchlights were observed as tabulated below:

Location	Number
I.P. (Nakiri)	1
Hamamatsu	1-2
Toyohashi	1
Omae-saki	1

g. Miscellaneous AA Observations:

(1) Several A/C reported a brilliant green light flashing on and off in the target area.

(2) One inaccurate ground-to-air rocket was reported 20 miles west of the target.

(3) Blackout of the target area was complete.

5. Mission No. 281 - Nippon Oil Refinery, Amagasaki:

a. The primary target was bombed by 83 A/C of the 315th Wing between 1420Z-1500Z from 15,400-16,900 feet. Axis of attack averaged 32°. Weather was reported as 4/10-8/10 undercast.

b. En route to the target meager, inaccurate and heavy flak was encountered near the I.P. (3415N - 13505E).

c. Over the target area flak was described as generally meager, inaccurate, heavy and medium. A few crews reported moderate fire.

d. On withdrawal flak was nil.

e. No A/C were lost to flak on this mission and of 83 A/C bombing 2 (or 2.4%) sustained flak damage.

f. Searchlight Activity:

(1) Searchlights were reported as follows:

Location	Coordinates	Number
Kada	3415N 13504E	2
Wakayama	3413N 13511E	2
Amagasaki	----	10
Kobe	----	15
Osaka	----	20
Takatsuki	3451N 13538E	6
Shimo Buchi	3422N 13546E	4

(2) All lights were generally ineffective through the undercast. One A/C was tracked for 3-5 minutes. The dispensation of "rope" proved very effective in eluding lights. Toward the end of the attack the lights were apparently employed in teams of 2-4 searching the general route of approach and withdrawal. This tactic resulted in little success.

g. One magnesuim flare and one ground-to-air rocket were observed in the target area. The rocket was characterized by 3 bursts occuring at 200-foot altitude intervals. The 3 bursts were white, red and green respectively.

PART III - SECTION A - DAMAGE ASSESSMENT*

FUKUI - 90.15 - URBAN

1. Summary of Damage:

Built-up area: Sq. Mi. total - 1.9; Sq. Mi. destroyed - 1.61
Percent destroyed - 84.8

Planned target area: 1.7 sq. mi. Percent destroyed: 95

Total damage to date: 1.61 sq. mi. Percent of built-up area: 84.8

Targets damaged by strike: 1 numbered; no other.

2. Report:

(1) Area Damaged from current strike:	Sq Mi	Destroyed Sq Mi	Per cent
Built-up area (Urban)	1.68	1.47	87.5
Built-up area (Industrial)	.22	.14	63.6
Built-up area (Total)	1.9	1.61	84.8

(2) Damage to targets:	New Damage	Total Damage
90.15-XXI 6246 Unidentified Industry	75%	75%

b. Damage outside built-up area (within 5 mile radius of the center of the city):

(1) Area damage from current strike:

Two areas NNW of the city sustained damage totalling .14 sq. mi.

(2) Damage to targets: None

An enlargement from XXI Bomber Command Litho-mosaic, Fukui Area, annotated to show damage, follows this page.

* Based on 20th A.F. C.I.U. D.A. Report No. 151

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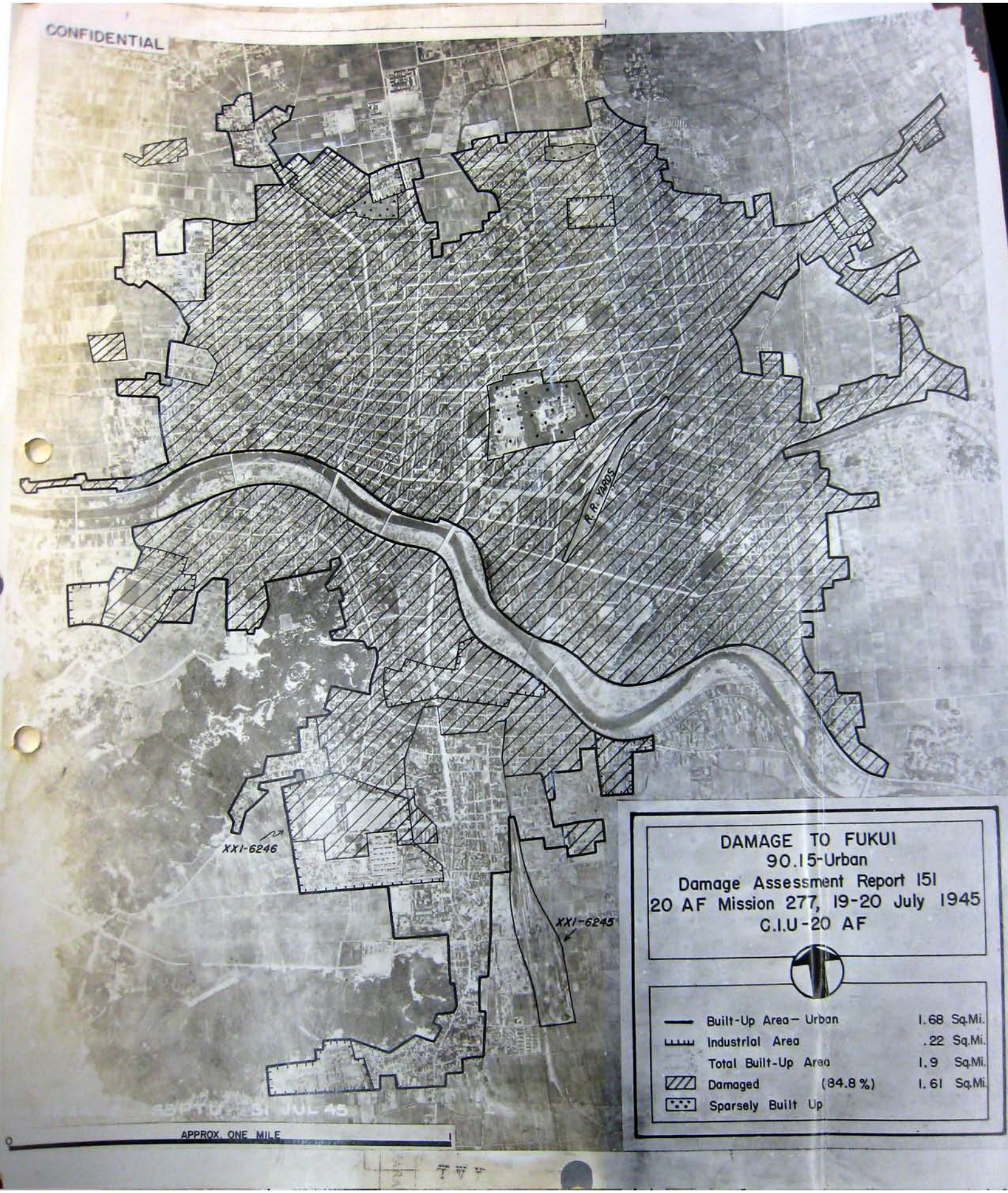

DAMAGE TO FUKUI
90.15-Urban
Damage Assessment Report 151
20 AF Mission 277, 19-20 July 1945
C.I.U-20 AF

Built-Up Area— Urban		1.68 Sq.Mi.
Industrial Area		.22 Sq.Mi.
Total Built-Up Area		1.9 Sq.Mi.
Damaged	(84.8%)	1.61 Sq.Mi.
Sparsely Built Up		

PART III - SECTION B - DAMAGE ASSESSMENT*

HITACHI - 90.14 - URBAN

1. Summary of Damage:

Built-up area: Sq. Mi. total: 1.38 - Sq. Mi. destroyed: .88

Percent destroyed: 64.5

Planned target area 1.2 sq. mi. Percent destroyed: 73.3

Total damage to date: 1.08 sq. mi.

Percent of built-up area: 78.2

Targets damaged by current strike: 3 numbered; 5 other.

Note: Data in this report supersedes that listed in all previous reports.

2. Report:

a. Damage within limits of built-up area:

(1) Area damage from current strike:

		Destroyed	
	Sq. Mi.	Sq. Mi.	Percent
Built-up area (Urban)	1.1	.85	77.2
Built-up area (Industrial)	.28	.03	10.7
Built-up area (Total)	1.38	.88	64.5

(2) Area damage from all strikes:

		Destroyed	
	Sq. Mi.	Sq. Mi.	Percent
Built-up area (Urban)	1.1	.87	79
Built-up area (Industrial)	.28	.21	75
Built-up area (Total)	1.38	1.08	78.2

(3) Damage to targets:

Number	Name	
812	Hitachi Copper Refinery	About 80% destroyed
1476	Hitachi Engineering Works, Kaigan Plant	96.8% (old damage)
2098	Hitachi Engineering Works, Densen Plant	About 30% damaged
2099	Hitachi Engineering Works, Yamato Plant	About 8% damaged

Railroad yard shows minor damage.
4 small unidentified industries 100% destroyed.

b. Damage outside built-up area (within 5 mile radius of the center of the city:

(1) Area Damage from current strike:

* Based on 20th A.F. C.I.U. D.A. Report No. 161

Two small areas NW of city are destroyed and one small area E of the city is partially destroyed. These areas are very near the city. Total area destroyed outside built-up area totals about .1 sq. mi.

(2) Damage to Targets:

1492 -	Hitachi Copper Smelter	No visible damage
U/I	Target just E of Hitachi	Minor damage
2200 -	Hitachi Engineering Works, Taga Plant, SW of Hitachi	Damaged as a result Of a U.S. Navy strike
4 U/I	Probable Industries	No visible damage

An enlargement from Navy Pre-strike 21-VD-72A follows this page.


HITACHI
GAS WORKS
KEY
Old Damage
New Damage
Sparsely Built Up Area
Industrial Area
CONFIDENTIAL
2688 C 35 PTU 4 AUG 45

PART III - SECTION C - DAMAGE ASSESSMENT*

CHOSHI - 90.14 - URBAN

1. Summary of Damage:

Built-up area: Sq. Mi. Total - 1.12; Sq. Mi. destroyed - .379

Percent destroyed: 33.8

Planned target area 1.0 sq. mi. Percent destroyed: 37.9

Total damage to date: .483 sq. mi.

Percent of built-up area: 43

Targets damaged by current strike: 3 numbered; 2 other

Note: Data in this report supersedes that listed in all previous reports.

2. Report:

a. Damage within limits of built-up area:

(1) Area damage from current strike:

	Sq. Mi.	Destroyed Sq. Mi.	Destroyed Percent
Built-up area (Urban)	1.06	.365	34.4
Built-up area (Industrial)	.06	.014	23.3
Built-up area (Total)	1.12	.379	33.8

(2) Area damage from all strikes:

Built-up area (Urban)	1.06	.469	44.2
Built-up area (Industrial)	.06	.014	23.3
Built-up area (Total)	1.12	.483	43.

Note: Previous damage: result of a prior strike (HE bombs)(Mission number unknown)

(3) Damage to targets:

Number	Name	Total Damage
90.14-XXI 6060	Unidentified, possible cannery	10%
" XXI 6061	" " "	40%
" XXI 6062	" " "	10%
	Freight Yards & RR Repair Sheds	None
	Soy Processing Plant	None
	Small-craft building area	None
	Three Unidentified Industries	2 destroyed (new damage)

(b) Damage outside built-up area (within 5 mile radius of the center of the city:

(1) Area damage from current strike: Several small areas.

* Based on 20th A.F. C.I.U. D.A. Report No. 150

(2) Damage to targets:

Number	Name	Total Damage
90.14-XXI 6063	Unidentified, possible cannery	None
" XXI 6083	Yokohama Yacht Building Co.	None
1464	Choshi Fighter AF	None
	Small-craft building area	None
	Unidentified Industry	None

A Mosaic, annotated to show damage, follows this page.


CONFIDENTIAL
Target
90.14 – Urban
Mission 279
19-20 July 1945
Damage Assessment Rpt 150
C.I.U. – 20 AF
2643 C 35PTU 01 JUL 45
Built-Up Urban Area
Built-Up Industrial Area
New Damage
Old Damage

PART III - SECTION D - DAMAGE ASSESSMENT*

OKAZAKI - 90.20 - URBAN

1. Summary of Damage:

Built-up area: Sq. Mi. total - .95; Sq. Mi. destroyed - .65

Percent destroyed - 68

Planned target area: .8 Percent destroyed: 81

Targets damaged by current strike: 0 numbered; 6 others

Limitations of coverage: 1/10 clouds

2. Report:

a. Damage within limits of built-up area (no previous damage):

(1) Area damage from current strike:

	Sq. Mi.	Destroyed Sq. Mi.	Percent
Built-up area (Urban)	.85	.60	71
Built-up area (Industrial)	.10	.05	50
Built-up area (Total)	.95	.65	68

(2) Damage to targets:

Unidentified Industrial Areas
(Numbers refer to annotated print)
Area No. 1 & 2 - no damage
" " 3 - 10% destroyed (Approximate)
" " 4 - 100% " "
" " 5 - 35% " "
" " 6 - 100% " "
" " 7 - 20% " "
" " 8 - 30% " "

b. Damage outside built-up area (within 5 mile radius of the center of the city):

(1) Area damage from current strike: Three small residential areas totalling .03 sq. mi. destroyed.

(2) Damage to targets:

90.20-2682 Okazaki Airfield No Damage
" 4073 Nisshin Textile Mill No Damage
" 4074 Probable Heavy Industry No Damage

A mosaic, annotated to show damage, follows this page.

* Based on 20th A.F. C.I.U. D.A. Report No. 159

CONFIDENTIAL

Damage Assessment Rpt 159
Damage To Okazaki
90.20 - Urban
Mission 280
19-20 July 1945
C.I.U. - 20 AF
2669 C 35 PTU 2AUG 45

PART III - SECTION E - DAMAGE ASSESSMENT*

NIPPON OIL REFINERY AND TANK FARM, AMAGASAKI

1. Summary:

a. Most of the damage resulting from Mission 281 is in the Fischer-Tropsch synthetic oil plant (Area A, in reference below) and in the tank farm (Area C, in reference below).

b. In the synthetic oil plant area most of the structures in the W part are destroyed or severely damaged. Among these strutures are all six of the gasometers, the probable purification buildings, the boiler house and possibly the gas convertors. (Note near misses at 63.)

c. In the tank farm area seven of the existing storage tanks (capacity 431,900 barrels; 42 USG), are destroyed or damaged. Two other tanks, with a total capacity of 123,400 barrels, have been removed and the remaining crude oil storage capacity of the tank farm has been cut to 185,100 barrels or 25 percent of the original capacity of 738,200 barrels.

d. The refinery units (Area B, reference below) remain undamaged except in storage tank areas 26, 27, 28 (reference below), where one tank has definitely been destroyed, and where near misses and pools of oil could indicate that invisible damage is present in possibly six more intermediate tanks in this area.

e. In storage area 31 (reference below), where three of the 12 tanks have been destroyed, near misses could again indicate invisible damage to five additional tanks.

f. In the circled area Y (on the damage assessment diagram) SW of 32, in what appeared on the pre-strike photos as an earth scar left by the removal of a tank, there is a large pool of oil which is possibly exposed underground storage.

g. The southernmost division of Area D (reference below), containing four storage tanks with a capacity of 100,700 barrels, and several minor buildings, is totally destroyed.

h. Total damage to tankage in the target area is about 587,300 barrels or 39 percent of the total original tankage. Tankage removed amounts to 123,400 barrels, or 8 percent of the total original tankage, and when combined with damage tankage brings the total to 710,700 barrels or 47 percent of the total original tankage.

i. Cloud cover did not permit assessment of damage to adjacent target areas.

* Based on 20th A.F. C.I.U. D.A. Report No. 155.

SUMMARY OF DAMAGE TO TANKAGE

		TYPE OF STORAGE				
		CRUDE	INTERMEDIATE	UNKNOWN	REFINED PRODUCTS	TOTAL
Orig. Capacity - bbls.		738,200	141,300	330,000	287,200	1,496,700
New Damage	- bbls.	431,900	5,000	21,100	129,300	587,300
	- %	58	4	64	45	39
Old Damage - none						
Removal	- bbls.	123,400	none	none	none	123,400
	- %	17				8
Total damage and removal	- bbls.	555,300	5,000	21,000	129,300	710,700
	- %	75	4	64	45	47

ITEMIZATION OF DAMAGE

ANNOT. NO.	IDENTIFICATION	DESCRIPTION OF DAMAGE, etc.
9	Probable storage, 7,700 sq. ft.	60% destroyed.
14	Storage, 8,700 sq. ft.	50% destroyed.
26	6 intermediate tanks	(3 near misses)
27	4 intermediate tanks	(2 near misses)
28	1 intermediate tank, 5,000 bbls.	Destroyed
29	Poss. Office or lab., 7,100 sq.ft.	25% destroyed
31	3 storage tanks, 28,600 bbls.	Destroyed (3 near misses caused prob. damage to 3 other tanks.
32	2 tanks, 7,000 bbls.	Destroyed
37	Unid. building, 3,900 sq.ft.	Superficial damage
40	Storage shed, 5,300 sq.ft.	50% destroyed or damaged (near miss on W side)
41	shop building, 6,100 sq.ft.	Destroyed
46	Gasometer, 746,100 cu.ft.	Destroyed
47	" " "	Damaged (or destroyed)
48	" " " "	Destroyed
49	" 986,700 cu.ft.	Destroyed
50	" 111,600 cu.ft.	Damaged
51	" " " "	Damaged
52	3 small tanks, 18,500 cu.ft.	2 damaged or destroyed, 14,100 bbl capacity.
53	Poss. pump house, 5,200 sq. ft.	Destroyed.
54	Unidentified building, 2,900 sq.ft.	Damaged or destroyed.
55 & 56	Poss. gas purification, 18,700 sq.ft.	Gutted.
57	" " " 7,000 sq.ft.	Gutted.
59	Associated with Co. 2 removal	Damaged.
60	Unidentified building, 3,500 sq.ft.	Heavily damaged.
61	" " 4,100 sq.ft.	Damaged.
62	Prob. Boiler house, 6,700 sq.ft.	Destroyed.
63	Building adjacent to gas converters, 5,000 sq.ft.	Roof destroyed (near misses prob. damaged gas converters (63).
64	Unidentified building, 7,400 sq.ft.	Destroyed.
65	Small cooling tower, 2,800 sq.ft.	50% destroyed.
70	" " " 7,000 sq.ft.	Damaged.
73	Contact oven house, 43,800 sq.ft.	Small roof area damage SW corner (near miss SW corner)
74	Office, 5,500 sq.ft.	Destroyed.
75	" 5,100 sq.ft.	Destroyed.

ANNOT. NO.	IDENTIFICATION	DESCRIPTION OF DAMAGE, etc.
77	Boiler house, 3,000 sq.ft.	Destroyed.
78	Storage building, 5,900 sq.ft. (Small building S of 78)	Destroyed. (Damaged).
85	Tank, 39,700 bbls.	Destroyed.
86	" " "	Destroyed.
87	" 16,300 "	Destroyed.
88	" 5,000 "	Destroyed.
89	Small pump house & sheds	Destroyed.
90	Tank, 61,700 bbls.	Destroyed.
91	" " "	Destroyed.
94	" " "	Destroyed.
95	" " "	Destroyed.
98	" " "	Destroyed.
99	" " "	Destroyed.
100	" " "	Destroyed.
101	Pumphouse, 2,000 sq.ft.	Probably damaged.

Reference: Functional Analysis Report No. F/A-99 AC/AS, 24 March 1945.

Inclosures: A. Post-strike mosaic 3PR5M345- 4L and 4R: 123, 22 July 1945.

B. Annotated Photo Enlargement 3PR5M85-3R: 44, 17 March 1945.

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LEGEND

- Destroyed or Structural Damage
- Gutted
- Superficial Damage
- X Near Miss
- ⊙ Removed

Damage Assessment R'pt 155
Target 90.25-1203
Nippon Oil Refinery & Tank Farm—Amagasaki
20 AF Mission 281
19-20 July 1945
C.I.U.- 20 AF

2647 C 35 PTU 31 JUL 45

Confidential

Damage Assessment R'pt 155
Target 90.25-1203
Nippon Oil Refinery & Tank Farm—Amagasaki
20 AF Mission 281
19-20 July 1945
C.I.U.- 20 AF

POST STRIKE - 22 JULY '45
TARGET 90.25-1203
NIPPON OIL REFINERY &
TANK FARM - AMAGASAKI
20 AF MISSION 281 -
19-20 JULY 1945
D.A. REPORT 155
C.I.U. - 20 AF

ANNEX

E

CONSOLIDATED STATISTICAL SUMMARY

Missions No. 277 through 281

19/20 July 1945

SECRET

~~XXI BOMBER COMMAND~~

TWENTIETH AIR FORCE

CONSOLIDATED STATISTICAL SUMMARY OF COMBAT OPERATIONS

FORM 34

MISSION NO 277 - 281

19 July 1945

Field Order #2

Mission #277 - 58th Wing - Fukui Urban Area - Normal Effort
Mission #278 - 73rd Wing - Hitachi Urban Area - Normal Effort
Mission #279 - 313th Wing - Choshi Urban Area - Normal Effort (3 Groups)
Mission #280 - 314th Wing - Okazaki Urban Area - Normal Effort
Mission #281 - 315th Wing - Nippon Oil Refinery, Amagasaki - 70 Aircraft

EFFECTIVENESS OF MISSIONS

Aircraft Airborne	584
Percent Of Aircraft On Hand	70.6%
Aircraft Bombing Primary Targets	553
Percent Of Bombing Aircraft Airborne	96.8%
Bombs Dropped On Primary Targets	4173 Tons
Bombs Dropped On Other Targets	26 Tons

Bombing Results - Preliminary reports indicate the following damage:

Mission #277 - 1.61 sq miles or 84.8% of built-up area destroyed.
Mission #278 - .88 sq miles or 64.5% of built-up area destroyed.
Mission #279 - .38 sq miles or 33.8% of built-up area destroyed.
Mission #280 - .65 sq miles or 68.0% of built-up area destroyed.
Mission #281 - No damage assessment available to date.

COST OF MISSIONS

Aircraft Lost	2
Percent Of Aircraft Airborne	0.3%
Aircraft Damaged	6
Percent Of Aircraft Airborne	1.0%
Crew Member Casualties	20
Percent Of Total Participating	0.3%

Aircraft Landing At Iwo Jima 25

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Issued 29 July 1945
33RD STATISTICAL CONTROL UNIT

SECRET

AIRCRAFT PARTICIPATING

MISSION ~~277 281~~

DATE ~~19 July 1945~~

UNIT	A/C ON HAND	A/C SCHED-ULED	A/C FAILING TO TAKE OFF	A/C AIR-BORNE	TIME OF TAKE OFF			TIME OF RETURN			A/C BOMBING PRIMARY TARGET	A/C BOMBING SECONDARY TARGET	A/C BOMBING OTHER TARGETS	AIRCRAFT COMPLETING OTHER TYPE MISSIONS	TOTAL A/C EFFECTIVE	TOTAL A/C NON-EFFECTIVE
					DATE	FIRST	LAST	DATE	FIRST	LAST						
									Mission #277							
56WG	187	120	2	118	19 July	0700 Z	0843 Z	19 July	2111 Z	2310 Z	116	-	1	-	117	1
		12 a	-	12							11	-	-	-	11	1
		3 b	-	3							-	-	-	3	3	-
									Mission #278							
73WG	186	118	-	118	"	0735 Z	0847 Z	"	2036 Z	2302 Z	114	-	1	-	115	3
		12 a	-	12							12	-	-	-	12	-
		3 c	-	3							-	-	-	3	3	-
									Mission #279							
313WG	141	86	1	85	"	0901 Z	0958 Z	"	2109 Z	2355 Z	79	-	-	-	79	6
		12 a	-	12							12	-	-	-	12	-
		3 d	-	3							-	-	-	3	3	-
									Mission #280							
314WG	179	120	4	118 e	"	0906 Z	1022 Z	19-20 July	2238 Z	0040 Z	115	-	1	0	116	2
		12 a	-	12							11	-	-	-	11	1
		2 f	-	2							-	-	-	2	2	-
									Mission #281							
315WG	134	85	2	84 h	"	0730 Z	0814 Z	19 July	2119 Z	2229 Z	83	-	-	-	83	1
		2 g	-	2							-	-	-	2	2	-
TOTAL	827	529	9	523	19 July	0700 Z	1022 Z	19-20 July	2036 Z	0040 Z	507	-	3	-	510	13
		~~48 b~~	-	~~48~~							~~46~~	-	-	-	~~46~~	~~2~~
		13	-	13							-	-	-	13	13	-

a Pathfinder aircraft.
b 2 wind run aircraft; 1 super dumbo aircraft.
c 2 super dumbo aircraft; 1 wind run aircraft.
d 2 RCM aircraft; 1 wind run aircraft.
e Includes 2 spare aircraft.
f 1 radar wind run aircraft; 1 super dumbo aircraft.
g 2 wind run aircraft.
h Includes 1 spare aircraft.

Aircraft Landing At Iwo Jima:
Mission #277 - 56th Wing - 16 aircraft.
Mission #278 - 73rd Wing - 1 aircraft.
Mission #279 - 313th Wing - 3 aircraft.
Mission #280 - 314th Wing - 4 aircraft.
Mission #281 - 315th Wing - 1 aircraft.

SECRET

SECRET

BREAKDOWN OF ALL AIRCRAFT FAILING TO BOMB PRIMARY TARGET

MISSION 277 - 281
DATE 19 July 1945

UNIT	MECHANICAL FAILURE			PERSONNEL ERROR			FLIGHT CONDITIONS			ENEMY ACTION			OTHER		
	Non-Effective	Bombed Secondary	Bombed Other	Non-Effective	Bombed Secondary	Bombed Other	Non-Effective	Bombed Secondary	Bombed Other	Non-Effective	Bombed Secondary	Bombed Other	Non-Effective	Bombed Secondary	Bombed Other
							Mission #277								
58WG	1	-	1	1 a	-	-	-	-	-	-	-	-	-	-	-
							Mission #278								
73WG	3	-	1	-	-	-	-	-	-	-	-	-	-	-	-
							Mission #279								
313WG	5	-	-	1 b	-	-	-	-	-	-	-	-	-	-	-
							Mission #280								
314WG	2 c	-	1	1 b	-	-	-	-	-	-	-	-	-	-	-
							Mission #281								
315WG	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL	12	-	3	3	-	-	-	-	-	-	-	-	-	-	-

a Air crew personnel error.
b Maintenance personnel error.
c Includes pathfinder aircraft.

SECRET

DISPOSITION OF BOMBS

MISSION 277 - 281

DATE 19 July 1945

UNIT	TYPE & WEIGHT OF BOMB	FUZE SETTING		LOADED ON AIR-BORNE AIRCRAFT		RELEASED ON TARGETS						JETTISONED		RETURNED		UNKNOWN	
						PRIMARY				TARGETS OF OPP.							
		Nose	Tail	No.	Tons	No.	Tons	No.	Tons	No.	Tons	No.	Tons	No.	Tons	No.	Tons
							Mission #277										
58WG	E-46 500# I.C.	Open 5000'		3871	774.2	3785	757.0			40	8.0	45	9.0	1	.2	-	-
	AN-M47A2 100# I.B.	Inst.	-	5835	201.2	5651	194.9			-	-	184	6.3	-	-	-	-
	T-3 Pamphlets	-	-	17	-	-	-			-	-	17	-	-	-	-	-
	AN-M47A2 100# W.P.	-	-	31	1.6	30	1.5			-	-	1	.1	-	-	-	-
	M-46 Photoflash	-	-	6	-	5	-			-	-	1	-	-	-	-	-
							Mission #278										
73WG	AN-M47A2 100# I.B.	Inst.	-	11839	408.2	11411	393.5			92	3.2	319	10.9	17	.6	-	-
	E-46 500# I.C.	Open 5000'		1256	251.2	1216	243.2			20	4.0	20	4.0	-	-	-	-
	E-36 500# I.C.	Open 5000'		40	6.7	40	6.7			-	-	-	-	-	-	-	-
	AN-M17A1 500# I.C.	Open 5000'		1320	330.0	1279	319.8			-	-	41	10.2	-	-	-	-
	M-46 Photoflash	-	-	44	-	40	-			-	-	4	-	-	-	-	-
							Mission #279										
313WG	E-46 500# I.C.	Open 5000'		3225	645.0	2988	597.6			-	-	237	47.4	-	-	-	-
	T4E4 500# Frag.	1000' below aircraft		170	34.0	156	31.2			-	-	13	2.6	1	.2	-	-
	AN-M47A2 100# I.B.	Inst.	-	736	25.4	736	25.4			-	-	-	-	-	-	-	-
	AN-M47A3 100# I.B.	Inst.	-	1472	50.8	1466	50.6			-	-	6	.2	-	-	-	-
							Mission #280										
314WG	E-46 500# I.C.	Open 5000'		2520	504.0	2475	495.0			-	-	45	9.0	-	-	-	-
	AN-M17A1 500# I.C.	Open 5000'		120	30.0	114	28.5			-	-	6	1.5	-	-	-	-
	AN-M47A2 100# I.B.	Inst.	-	11767	405.7	9467	326.5			184	6.3	2116	72.9	-	-	-	-
	M-46 Photoflash	-	-	49	-	48	-			-	-	1	-	-	-	-	-
							Mission #281										
315WG	AN-M64 500# G.P.	.1	.025	2367	716.8	2307	701.8			18	4.5	42	10.5	-	-	-	-

(CONTINUED ON THE FOLLOWING PAGE)

SECRET

DISPOSITION OF BOMBS

MISSION 277 - 281

DATE 19 July 1945

UNIT	TYPE & WEIGHT OF BOMB	FUZE SETTING		LOADED ON AIR-BORNE AIRCRAFT		RELEASED ON TARGETS						JETTISONED		RETURNED		UNKNOWN	
						PRIMARY				TARGETS OF OPP.							
		Nose	Tail	No.	Tons	No.	Tons	No.	Tons	No.	Tons	No.	Tons	No.	Tons	No.	Tons
TOTAL	E-46 500# I.C.			10872	2174.4	10464	2092.8			60	12.0	347	69.4	1	.2	-	-
	AN-M47A2 100# I.B.			30177	1040.5	27265	940.3			276	9.5	2169	90.1	17	.6	-	-
	AN-M47A3 100# I.B.			1472	50.8	1466	50.6			-	-	6	.2	-	-	-	-
	AN-M64 500# G.P.			2867	716.8	2807	701.8			18	4.5	42	10.5	-	-	-	-
	AN-M17A1 500# I.C.			1440	360.0	1393	348.3			-	-	47	11.7	-	-	-	-
	T4E4 500# Frag			170	34.0	156	31.2			-	-	13	2.6	1	.2	-	-
	E-36 500# I.C.			40	6.7	40	6.7			-	-	-	-	-	-	-	-
	AN-M47A2 100# W.P.			31	1.6	30	1.5			-	-	1	.1	-	-	-	-
	M-46 Photoflash			99	-	93	-			-	-	6	-	-	-	-	-
	E-3 Pamphlets			17	-	-	-			-	-	17	-	-	-	-	-
	TOTAL			47185	4384.8	43714	4173.2			354	26.0	3098	184.6	19	1.0	-	-

SECRET

MISSION 277 - 281
DATE 19 July 1945

AIRCRAFT LOST AND DAMAGED

UNIT	AIRCRAFT LOST							AIRCRAFT DAMAGED									PERSONNEL CASUALTIES				
															TOTAL		PERSONNEL CASUALTIES				
	ENEMY A/C	ENEMY A/A	ENEMY A/C & A/A	ACC. & MECH.	OTHER	UN-KNOWN	TOTAL	ENEMY A/C	ENEMY A/A	ENEMY A/C & A/A	ACC. & MECH.	OWN GUNS	OTHER	UN-KNOWN	MAJOR	MINOR	TOTAL PARTICI-PATING	KILLED	MISS-ING	WOUNDED & INJURED	TOTAL CASUALTIES
										Mission #277											
58WG	-	-	-	-	-	-	None	-	-	-	-	-	1	-	-	1	1513	-	-	1	1
										Mission #278											
73WG	-	-	-	1 a	-	1 b	2	-	-	-	-	-	-	-	-	None	1519	4	13	1	18
										Mission #279											
313WG	-	-	-	-	-	-	None	-	-	-	-	-	-	-	-	None	1122	-	-	-	None
										Mission #280											
314WG	-	-	-	-	-	-	None	-	-	-	-	-	1	-	-	1	1497	-	-	1	1
										Mission #281											
315WG	-	-	-	-	-	-	None	-	2	-	2	-	-	-	-	4	882	-	-	-	None
TOTAL	-	-	-	1	-	1	2	-	2	-	2	-	2	-	-	6	6533	4	13	3	20

a Lost two engines shortly after take off; electrical system failed. Aircraft ditched. 11 men aboard - 5 rescued, 4 killed, 2 missing.
b Missing - no word. 11 men aboard - all missing.

SECRET

MISSION 277 - 281

DATE 19 July 1945

ENEMY OPPOSITION AND AMMUNITION EXPENDITURE

UNIT	ENEMY A/C SIGHTED	ATTACKS BY E/A	ENEMY A/C DESTROYED & DAMAGED				50 CALIBER AMMUNITION EXPENDITURE				
			TYPE OR MODEL	DES-TROYED	PROB. DESTR'D	DAMAGED	FIRED IN COMBAT	TEST FIRED	JETTISONED	ON LOST A/C	TOTAL
58WG	8	-		-	-	Mission #277 None	-	450	-	-	450
73WG	1	-		-	-	Mission #278 None	-	193	-	1200	1393
313WG	3	-		-	-	Mission #279 None	-	-	-	-	-
314WG	9	-		-	-	Mission #280 None	16	880	-	-	896
315WG	15	-		-	-	Mission #281 None	-	3703	-	-	3703
TOTAL	30-35	-		-	-	None	16	5226	-	1200	6442

SECRET

MISSIONS 277 - 281

DATE 19 July 1945

FLIGHT DATA & FUEL CONSUMPTION

MISSION NUMBER	#277	#278	#279	#280	#281
UNIT	58TH WG	73RD WG	313TH WG	314TH WG	315TH WG
AIRCRAFT CONSIDERED	112	125	87	123	84
AVERAGE FLYING TIME	14:28	13:47	13:07	13:45	14:21
FUEL CONSUMED:					
Average	5780	5695	5548	5790	5420
Maximum	6300	6276	6079	6247	5942
Minimum	5225	5277	5071	5325	4992
FUEL REMAINING:					
Average	752	910	852	884	999
Maximum	1475	1320	1329	1425	1542
Minimum	350	494	321	399	585
AVG. GALS. USED PER HOUR	399.4	413.3	422.9	421.1	377.7
TOTAL USED ON AIRBORNE A/C	776922	756805	535757	768567	460653

WEIGHT DATA

NO. AIRCRAFT AIRBORNE	130	131	97	130	86
AVG. BASIC WT. OF AIRCRAFT	74883	75013	74768	75603	71192
AVERAGE USEFUL LOAD	60327	59946	60046	59954	61217
AVG. NO. OF BOMBS LOADED	Mixed Load	Mixed Load	Mixed Load	Mixed Load	33.3 (M64)
AVG. WT. OF BOMBS LOADED	15829	15214	16468	15021	17832
AVERAGE FUEL LOADED	6535	6603	6400	6660	6435
AVG. WT. OF FUEL LOADED	39210	39618	38400	39960	38610
AVERAGE MISC. WEIGHT	5288	5114	5178	4973	4775
AVG. GROSS WT. AT TAKE OFF	135210	134959	134814	135557	132409

Bomb Weights:
E-46 - 425 lbs.
M-47A2 (IB) - 70 lbs.
M-47A2 (WP) - 125 lbs.
E-36 - 360 lbs.
M-17A1 - 465 lbs.
T4E4 - 425 lbs.
M-47A3 - 70 lbs.
M-46 - 52 lbs.
M-64 (TNT) - 535 lbs.

ANNEX

F

TWENTIETH AIR FORCE FIELD ORDER

Missions No. 277 through 281

19/20 July 1945

S E C R E T
Auth: CG Twentieth Air Force
Initials:
Date: 19 July 1945

FIELD ORDERS)
:
NUMBER 2)

TWENTIETH AIR FORCE
GUAM
19 July 1945 - 0300K

Maps: Japan Aviation Chart 1:218,880.

1. Omitted.

2. Twentieth Air Force attacks FUKUI, HITACHI, CHOSHI, and OKAZAKI URBAN INDUSTRIAL AREAS and Target No. 90.25 - 1203 on night of 19/20 July 1945.

3. a. 58th Wing:

(1) Primary visual and radar target: FUKUI URBAN AREA (90.15)

MPI	FORCE REQUIRED
051085	Normal Effort

MPI Reference: XXI BomCom Litho-Mosaic FUKUI AREA (90.15) URBAN.

(2) Route:

Base
Iwo Jima
3335N - 13558E
35263ON - 13609E (IP)
Target (3604N - 13614E)
Right Turn
3438N - 13805E
Iwo Jima
Base.

(3) Altitudes:

(a) Enroute to target: 6,000 - 6,800 ft. and 9,000 - 9,800 ft.

(b) Attack: 12,000 - 12,800 ft.

(c) Enroute from target: Minimum 16,000 ft.

(4) Bomb Load: 1 group - M-47 IBs fuzed instantaneous nose
Intervalometer setting - 75 ft.
3 groups - Clusters containing M-69 bombs fuzed to open 5,000 ft. above target.
Intervalometer setting - 50 ft.
All A/C carrying M-47 IBs will load one 100 lb White Phosphorus bomb in each of the first four stations to be released. Load WP bomb in No. 1 position of clusters.

(5) Takeoff: 191700K.

b. 73rd Wing:

(1) Primary visual and radar target: HITACHI URBAN AREA (90.14

MPI	FORCE REQUIRED
115121	Normal Effort

MPI Reference: XXI BomCom Litho-Mosaic HITACHI AREA 90.14-1476.

(2) Route:
Base
Iwo Jima
3530N - 14026E
3556N - 1402830E (IP)
Target
Right Turn
3545N - 14105E
Iwo Jima
Base

(3) Altitudes:
(a) En route to target: 3,000 - 3,800 ft. and 8,000 - 8,800 ft.
(b) Attack: 12,000 - 12,800 ft.
(c) En route to target: Minimum 15,000 ft.

(4) Bomb Load: 2 groups - M47 IBs fuzed instantaneous nose, Intervalometer setting - 75 feet.
2 groups - M17 ICs to extent available, otherwise clusters containing M69 bombs fuzed to open 5,000 ft. above target. Intervalometer setting - 50 feet.

(5) Take-off: 191730K.

c. 313th Wing:

(1) Primary visual and radar target: CHOSHI URBAN AREA (90.14)

MPI	FORCE REQUIRED
083084	3 Groups (Normal Effort)

MPI Reference: XXI Bom Com Litho-Mosaic CHOSHI AREA 90.14 - URBAN

(2) Route:
Base
Iwo Jima
3352N - 13936E
351030N - 1402230E
Target (3544N - 14050E)
Right Turn
Iwo Jima
Base.

(3) Altitudes:

(a) En route to target: 3,000 - 3,800 ft. and 8,000 - 8,800 ft.
(b) Attack: 10,000 - 10,800 ft.

(c) En route from target: Minimum 13,000 ft. maximum 14,500 ft.

(4) Bomb Load: 12 pathfinders - M-47 IBs fuzed instantaneous nose. Intervalometer setting - 50 ft.
Balance of Force - Clusters containing M-69 bom fuzed to open 5,000 ft. abov target.

Each of the main force A/C will carry two 500 lb Frag Clus loaded to be released last, fuzed to open 1,000 ft. beneat A/C. Intervalometer setting, all clusters - 35 ft.

(5) Takeoff: 191900K.

(6) R.C.M.: Two special jamming A/C will be dispatched to orbit the point 3544N - 14043E for duration of strike. Lowest A/C - 15,000 ft.

d. 314th Wing:

(1) Primary visual and radar target: OKAZAKI URBAN AREA.

MPI	FORCE REQUIRED
044035	Normal Effort.

MPI Reference: XXI Bom Com Litho-Mosaic OKAZAKI AREA 90.20 - URBAN.

(2) Route:

Base
Iwo Jima
34163ON - 13654E (IP)
Target
Right Turn
3455N - 13750E
Iwo Jima
Base

(3) Altitudes:

(a) Enroute to target: 6,000 - 6,800 feet and 9,000 - 9,800 ft.

(b) Attack: 14,000 - 15,400 ft.

(c) Enroute from target: Minimum 14,000 ft.

(4) Bomb Load: 2 groups: (including pathfinders) M-47 I.B.'s fused instantaneous nose, intervalometer setting 75 ft.

2 groups: clusters containing M-69 bombs fused to open 5,000 ft. above target. Intervalometer setting 50 ft.

(5) Takeoff: 191900K.

e. 315th Wing:

(1) Primary visual and radar target: 90.25-1203 NIPPON OIL REFINERY.

MPI	FORCE REQUIRED
055066	70 Aircraft

MPI Reference: XXI Bom Com Litho-Mosaic NAGASAKI - OSAKA AREA 90.25 - URBAN.

(2) Route:

Base
Iwo Jima
3350N - 13445E
34153ON - 13504E (IP)
Target
3453N - 13526E
Right Turn
3407N - 13618E
Iwo Jima
Base

(3) Altitudes:

(a) Enroute to target: 5,000 - 5,800 ft and 7,000 - 7,800 feet.

(b) Attack: 15,000 - 16,000 ft.

(c) Altitude enroute from target: 14,000 ft.

(4) Bomb Load: 500 lb. GP's fuzed 1/40 nose and non-delay tail.

(5) Takeoff: 191730K.

X. (1) Method of attack: By individual aircraft with force compressing attack into shortest practical strike time.

(2) All wings except 315th, will designate the first 12 aircraft to strike target first pathfinders and will be flown by best radar bombing crews.

(3) Bombing airspeed: CIAS 195 MPH.

4. Tactical Mission Numbers:

FUKUI	- No. 277
HITACHI	- No. 278
CHOSHI	- No. 279
OKAZAKI	- No. 280
90.25-1203	- No. 281

5. a. (1) The special jamming aircraft for the 313th Wing will be equipped to barrage jam the regions 190-210 and 72-84 megacycles. Spot jamming will be conducted over the frequency ranges 180-190 and 210-220 megacycles as desired by the Wing Commander and as governed by the capacity of each wing. In addition, all strike aircraft will be equipped with one jammer within the barrage band listed above providing sufficient equipment is available.

(2) All wings will be equipped to barrage jam the region 190-210 megacycles. Spot jamming will be conducted over the frequency ranges 180-190, 210-220 and 72-84 megacycles as desired by the Wing Commander and as governed by the equipment available.

(3) Observations of the extent and reliability of the barrage will be made while over the target.

(4) Jammers will be kept in operation at all times when closer than 50 miles to the mainland, and will be turned off at all other times, except for preflight and postflight frequency checks, which are to be made on the ground while the jammers are installed in the airplanes.

b. Command Post: Hq., Twentieth Air Force, GUAM

BY COMMAND OF MAJOR GENERAL LeMAY:

A W KISSNER
Brigadier General, USA
Chief of Staff

OFFICIAL:

JOHN B MONTGOMERY
Colonel, GSC
D C/S, Operations

ANNEX

G

DISTRIBUTION

Missions No. 277 through 281

19/20 July 1945

DISTRIBUTION

TACTICAL MISSION REPORT

Copy No.	
1	Commanding General, Army Air Forces
2	Commanding General, U.S. Army Strategic Air Forces (Rear)
3	Commanding General, U.S. Army Strategic Air Forces (Guam)
4 - 5	Chief of Staff, U.S. Army Strategic Air Forces (Guam)
6	Commanding General, Twentieth Air Force
7	Commanding General, Eighth Air Force (Okinawa)
8	Commander in Chief, U.S. Army forces, Pacific
9	Chief of Naval Operations, OP-16-V
10	Commander in Chief, Pacific Fleet (Adv Hq)
11	Commander in Chief, Pacific Fleet (Rear Hq)
12	Commander Air Force, Pacific Fleet
13	Commander, Third Fleet
14	Commander, Fifth Fleet
15	Commander, First Carrier Task Force
16	Commander, Marianas
17	Commanding General, U.S. Army Forces, Middle Pacific
18	Commanding General, Allied Air Forces, SWPA
19	Commanding General, Far East Air Forces
20	Commanding General, U.S. Strategic Air Forces in Europe
21	Commanding General, Mediterranean Allied Air Forces
22	Commanding General, Fifteenth Air Force
23 - 24	Commanding General, Seventh Air Force
25	Commanding General, VII Bomber Command
26 - 27	Commanding General, VII Fighter Command
28	Commanding General, Eleventh Air Force
29 - 33	Commanding General, 301st Fighter Wing
34	Comnand Hq, Allied Air Forces, SWPA ATTN: Senior Intelligence Officer, R.A.A.F.
35	Commander in Chief, U.S. Army Forces, Pacific ATTN: G-2 (For Section 22, RCM)
36	Officer in Charge, Joint Intelligence Center Pacific Ocean Areas
37	Commanding General, Army Air Forces ATTN: AC/AS Intelligence
38 - 67	Commanding General, Army Air Forces ATTN: AC/AS, Intelligence, Collection Division
68 - 69	Commanding General, U.S. Army Strategic Air Forces (Guam) ATTN: Intelligence
70	Commanding General, U.S. Army Strategic Air Forces (Guam) ATTN: Communications FOR: Counter Measures Air Analysis Center
71	Commanding Officer, Twentieth Air Force Lead Crew School
72	Brigadier General, H.S. Hansell, Jr.
73	Chief of Staff, Twentieth Air Force
74	Deputy C/S Opns, Twentieth Air Force
75	AC of S, A-2, Twentieth Air Force
76	Chemical Warfare Officer, Twentieth Air Force
77	Ordnance Officer, Twentieth Air Force
78	Director of Tactics, A-3 Twentieth Air Force
79 - 80	Historical Officer, Twentieth Air Force

81	Commanding General, 58th Bombardment Wing
82	Commanding General, 73rd Bombardment Wing
83	Commanding General, 313th Bombardment Wing
84	Commanding General, 314th Bombardment Wing
85	Commanding General, 315th Bombardment Wing
86	Commanding Officer, 3rd Photo Reconnaissance Sq
87	Commanding Officer, 41st Photo Reconnaissance Sq
88	Commanding Officer, 55th Reconnaissance Sq, Long Range Weather
89	Commanding Officer, Twentieth Air Force Combat Staging Center (Provisional)
90	Commanding Officer, 33rd Statistical Control Unit
91	Commanding Officer, 6th Bomb Group (VH)
92	Commanding Officer, 9th Bomb Group (VH)
93	Commanding Officer, 16th Bomb Group (VH)
94	Commanding Officer, 19th Bomb Group (VH)
95	Commanding Officer, 29th Bomb Group (VH)
96	Commanding Officer, 39th Bomb Group (VH)
97	Commanding Officer, 40th Bomb Group (VH)
98	Commanding Officer, 330th Bomb Group (VH)
99	Commanding Officer, 331st Bomb Group (VH)
100	Commanding Officer, 444th Bomb Group (VH)
101	Commanding Officer, 462nd Bomb Group (VH)
102	Commanding Officer, 468th Bomb Group (VH)
103	Commanding Officer, 497th Bomb Group (VH)
104	Commanding Officer, 498th Bomb Group (VH)
105	Commanding Officer, 499th Bomb Group (VH)
106	Commanding Officer, 500th Bomb Group (VH)
107	Commanding Officer, 501st Bomb Group (VH)
108	Commanding Officer, 502nd Bomb Group (VH)
109	Commanding Officer, 504th Bomb Group (VH)
110	Commanding Officer, 505th Bomb Group (VH)
111	Commanding Officer, 509th Composite Group
112	Commanding Officer, 15th Fighter Group (VLR)
113	Commanding Officer, 21st Fighter Group (VLR)
114	Commanding Officer, 414th Fighter Group (VLR)
115	Commanding Officer, 506th Fighter Group (VLR)
116	Reporting Unit, A-2, Twentieth Air Force (File Copy)
117 - 130	Reporting Unit, A-2, Twentieth Air Force