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RAIL TRANSPORTATION PROBLEMS IN ITALY

by

Generalmajor [Brigadier General] and Bevollmächtigter [Deputy]

General of the Chief of Transportation

Karl Theodor K o e r n e r

Done at G a r m i s c h, Germany

Date: 8 April 1947

Sources: own memory; no documents

Sketches, etc. map: Italy 1/1 000 000

List of Abbreviations:

Chef d. Trsp. W. - Chef des Transportwesens -
[Chief of Transportation]

Gen. d. Trsp. W. - General des Transportwesens -
[General of the Transportation
System (of Italy; see p. 9 of
translation)]

W.V.D. Italien - Wehrmachts-Verkehrs-Direktion
Italien - [Italian Directorate
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Note

18 Mar 54

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OFFICE OF THE CHIEF OF MILITARY HISTORY
DEPARTMENT OF THE ARMY
WASHINGTON 25, D. C.

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RAILROAD TRANSPORTATION PROBLEMS IN I T A L Y

- I. The Rail Situation in Italy.
- II. The Concentration of Heeresgruppe [Group of armies] R o m m e l and the Taking over of the Italian Railroads.
- III. Effect of the Allied Air Forces on the Italian Railway Net.
- IV. Examination of the Transportation Problems from the Technical Standpoint in a Concentration of German Forces and their Supply for the Repulse of Hostile Landings in the Fall of 1942 in the Various Areas within the Jurisdiction of OB SÜd.

I. The Rail Situation in Italy

1.) General Survey

Italy's railway net is imposed by the geographical conformation of the country, the distribution of industries and the requirements of traffic from outside the country.

Consequently, in Upper Italy we find a well developed railway net. In central and southern Italy, on the other hand, roads lead only to the two coasts, while in the interior of central Italy there is in addition an extensive net.

The farther south one goes, the more unimportant the net, so that by the time one reaches Sicily there is only one poorly developed net to be found.

Along with the limited industrialization of central and southern Italy and the great terrain problems there, the decisive factor in the poor development of the railways [there] has been the highly devel-

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Along with the limited industrialization of central and southern Italy and the great terrain problems there, the decisive factor in the poor development of the railways [there] has been the highly developed coastal shipping with its cheap freight rates.

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2.) Border Crossings

a.) From the West: 2 lines.

1.) The coastal road generally running close to the coast; many engineering improvements [bridges, viaducts, etc.],^{*)} therefore, from the military standpoint easily disturbed by attacks from the air and sea.

An efficient single track line.

2.) Mont Cenis railway.

A difficult track to construct. Train lengths and train weights limited. Efficient. Many improvements [bridges, etc.].^{*)} Great Mont-Cenis tunnel. Double tracked.

b.) From the North:

1.) Swiss passes.

a) At Domedossola, single track, efficient.

b) Main track via Como, double-tracked, completely improved.

2.) From Austria:

Brenner line. Double-tracked. Very well improved by Italy after World War I. Efficient stations. Trains limited in length and weight. Some difficult improvements [engineering features, bridges, etc.].^{*)} Selection of a new right of way would make it possible to avoid large bridges. Very efficient main line. Branch from Franzensfeste to Lienz, Austria, single tracked line.

c.) From the East:

1.) From Austria:

a) Single-tracked line Villach-Udine. A mountain line; efficient branch line.

b) Single-tracked line Klagenfurt-Goerz. A mountain line; less efficient branch line.

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^{*)} German word is "Kunstbauten" [Translator's note]

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2.) From Jugoslavia:

Laibach - Trieste. Double-tracked main line;
efficient road.

3.) Upper Italy Net

Course of Po exercises an important influence on this
system.

For north and south traffic the Po bridges constitute
traffic bottlenecks:

8 large bridges: north of Ferrara
(all single-tracked)

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(all single- | Mantua, Cremona, Piacenza, south of Pavia,
tracked, except | north of Alessandria, Casale.
Piacenza which |
is double-tracked)

2 Double-tracked main lines:

Vizenza - Ferrara - Bologna

Milan - Genoa

1 Single-tracked line:

Verona - Bologna

These lines are well improved and efficient.

East - West:

North of the Po: Goerz - Udine - Verona - Milan - Turin,
with a southern branch line Trieste - Padua - Vizenza.

South of the Po: Rimini - Bologna - Parma - Milan. These
lines are well improved and efficient.

Main Junction Stations:

Milan, Verona, Vizenza, Padua, Bologna, Maestre (near Venice).

Large switching yards; repair shops.

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4.) Central Italy

North-South:

There are only 3 lines, the most efficient of which is the one running in the interior.

The line along the Adriatic coast is of little importance. The line on the west coast from the military port Spezia is double-tracked and efficient.

The two efficient lines meet in Rome.

The two coastal lines run close to the coast; consequently, they are especially vulnerable to interference by sea and air.

In consequence of its mountainous character the main north-south line Bologna - Florence - Rome also has many difficult engineering features [Kunstbauten].

East-West lines:

There is a single one-track line Ancona - Orte serving as connection between the central line and the east railway and two short connections between the central and west lines:

- a) Florence - Pisa
- b) Prato - Lucca - Pisa

In general it can be stated that on account of the inadequacies of these facilities there was very little opportunity to shift from any of these 3 lines to the others.

The side line Emboli - Siena - Chiusi or north of the Grosseto (to the west line) was of considerable importance, when the main lines were interrupted by the constant air attacks, something that happened frequently.

Florence and Rome are main junction points.

The railway facilities of Rome had not been expanded to any great extent during the war. As a result, pr

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Florence and Rome are main junction points.

The railway facilities of Rome had not been expanded to any great extent during the war. As a result, problems arose rather frequently on those occasions when transportation was moving on a large scale.

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5.) Southern Italy

From Rome two main roads lead to Naples. Both lines fully completed, the coast line more liable to hostile action than the line in the interior through Cassino.

The extension of the Adriatic coast line to Foggia is also low in efficiency. Between Foggia and Bari it is more efficient, but from Bari to Reggio via Taranto it is worse again.

The western line from Naples to Reggio likewise should only be considered as a secondary road.

The two east - west connecting lines are of little importance and of low efficiency.

6.) Sicily

The railway net of Sicily is only poorly developed. From the standpoint of efficiency they cannot be considered as better than secondary lines.

The Messina - Reggio railway ferries similarly are only able to handle a small amount of traffic without difficulty.

7.) Railway Operation

a.) Operating equipment

The Italian national railways have at their command ample amounts of rolling stock and a sufficient number of locomotives.

Electrical operation has been developed to a high degree, so as to be freed of the necessity of importing coal. Excellent electrical locomotives were available. For military reasons a number of steam locomotives in excess of actual requirements were kept in operation, so as to be able to take over in case electric operation broke down. The locomotives were obsolete and in poor operating condition. Moreover, the installations for supplying coal and water necessary for steam operation were maintained only to a limited extent. Their technical condition did not meet modern requirements.

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b) Communication facilities

Incomprehensibly, from the German standpoint, all important communications facilities belonged to foreign concerns.

The railroad had no real telephone system. This could not help but have an effect on the smoothness of operation.

c) Facilities for detouring around main junction points

These had not been developed to any extent. In consequence, when demands were heavy difficulty arose in carrying out transportation movements on a large scale.

d) Military railway operation was directed in detail from a central office in Rome.

8.) Summary

Viewed from the military angle, the operation of Italy's railways is extremely sensitive to military interferences of every sort.

The main danger points are traceable to:

a) The bottle-necks in the railway net

Upper Italy: Po - barrier

Few junction points, but those few important to operation.

Difficult roads coming in from border countries.

Central Italy: Only 2 efficient lines, which have many engineering works [Kunstbaute] which could be easily destroyed, and 2 particularly sensitive points: railway installations of Rome and of Florence.

Southern Italy: Very poorly developed railway net, with lines especially easy to cut.

b) Breakdown of electrical train service, only few large power-stations. No coal output in own land.

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To regulate railway traffic in Italy in wartime it is, therefore, of essential importance that we be much superior in the air and be in control of the Adriatic and the Tyrrhenian Seas as well.

Viewing the problem from the purely operational standpoint, the German High Command sought to obtain :

1. improvements and amplification of the railway communications system, in order to be able to effect a substantial increase in the efficiency of the roads;
2. decentralization of operation, in order to increase the fluidity of operation.

II. The Concentration of Heeresgruppe Rommel and the Taking Over of the Italian Railroads

In order to prepare for German defensive measures when Italy switched to the Allies in 1943, the Heeresgruppe Rommel was concentrated.

As far as the railroads were concerned there was no difficulty.

Three concentration areas:

- a) Southern France: The Marseille region and east thereof to the frontier and along the Mont Cenis line .
- b) Southern Germany: South of Munich and around Innsbruck.
- c) Carinthia: Around Klagenfurt.

For taking over the operation of the Italian railroads a "Wehrmachts-Verkehrs-Direktion (W.V.D.) [Directorate of Transport of the Armed Forces] was set up. It consisted of 10,000 (round numbers) taken from the personnel of the German National Railways and suitable military personnel.

Upon the defection of Italy, units of the W.V.D. were sent into Italy by passenger trains on all roads leading there. These were immediately distributed from railway station to railway station on the rail lines considered absolutely essential to the German combattant

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The Italian railway personnel nowhere attempted serious resistance, so that the work of taking over was handled expeditiously.

The greater part of the Italian railway personnel continued in the service of the roads. Until the end of the war no acts of sabotage took place either, although the personnel showed increasingly less enthusiasm in their duties because of the very severe effects of air action.

All railway operation in Italy, to the extent that it was in German hands, consequently was under the W.V.D. of Italy, located in Verona. So long as the front lay south of Rome, a branch office of the W.V.D. was located in Florence.

An especial effort was made by German communications troops to improve the railway communications [telegraph, etc.] system. By dint of untiring activity they succeeded in doing so with the railway telephone system.

All of the railway transport system in Italy was under the "General of the Transportation system of Italy," who was under the Chef des Trsp. W. The latter was also technical adviser to OB Süd.

Under the General of the Transportation System [of Italy] were:

- a) In the armies: The Bv. T.O. [Chief Transportation Officer].
- b) In the entire Theater: The transport control headquarters at Rome, Bologna, Venice, Milan.
- c) The W.V.D. of Italy.
- d) The Railway Pioneer Commander.

III. Effect of the Allied Air Forces on the Railways of Italy

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On the German side, from the start of the fighting in the Mediterranean, it was anticipated that the points of essential importance to railway operation would immediately be attacked by the Allies.

These were:

1. The Brenner road
2. The Po bridges
3. Bologna junction point
4. Several of the larger engineering projects on the Bologna - Florence - Rome main line.

As a matter of fact, it was not until July of 1944 that objectives Nos. 1. and 2., so vital to the German conduct of the war, were really seriously attacked.

The first attacks against the Brenner road began in the fall of 1944 but were rather weak.

From July 1944 on, the Allied air superiority in Italy was so absolute that as a general thing traffic was possible only at night.

If the Allies had attacked the Brenner road and the Po bridges back in 1943 as steadily as they did from mid-1944 on, the movement of organizations and the requisite normal flow of supplies would have been made a very difficult problem, if it had not been completely stopped.

If that had happened, German resistance in Italy would have collapsed. Furthermore, the exchange of organizations that was still very active at that time between the zone of OB Süd and other fronts would have been stopped.

When the front was south of Rome in central Italy, the lines in central Italy were attacked so regularly and steadily that it became extraordinarily difficult to move up supplies or reserves. The situation recurred in similar form when the Apennine position was held.

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When the front was south of Rome in central Italy, the lines in central Italy were attacked so regularly and steadily that it became extraordinarily difficult to move up supplies or reserves. The situation recurred in similar form when the Apennine position was held, although the more extensively developed rail net there afforded opportunity for detour routing.

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Only by putting into execution the following measures was it possible to fulfill the exceedingly difficult mission of keeping essential rail traffic moving, the very heavy air attacks notwithstanding:

1.) Repair measures:

a) Railway pioneers and railway construction units were reinforced by Italian labor units, which were disposed along the most important lines and so decentralized as to ensure that work would begin as speedily as possible.

b) Every possible type of repair materials was unloaded all along the lines in adequate amounts, in order to save moving material more than by short distances.

c) Camouflage on a big scale, especially at the Po bridges, the wrecked ruins of which were allowed to remain as far as possible just as they were. The replacement bridge was built into the old in a manner to render it inconspicuous, to be shoved in on the old bridge only when needed.

2.) Operating measures:

a) If through-traffic ceased to be possible because of permanent interruptions, recourse was had to "island traffic," i.e., a sort of "street railway operation" was used from one interruption point to another. All operating blocks could be ignored. Of course, in doing so one frequently had to put up with transloading by truck for short distances.

b) If a bridge was O.K., trains were sent across as they came up to the bridge.

c) In rainy weather these opportunities to increase travel were likewise used.

In this manner, despite the extremely heavy damage inflicted and the constant superiority of the Allies in the air, it was possible

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Until the winter of 1944-1945 troops were brought to and from Italy. Even in the early months of 1945 divisions were still being brought from Verona and East Italy to the east front, although the rate of movement was slow.

The chief credit for carrying out rail movements in spite of the Allies' absolute superiority in the air was due to the untiring and indefatigable efforts of the railway pioneers and railway troops and the exemplary work of all transportation officials within the jurisdiction of the General of the Transportation System in Italy.

IV. Examination of the Transportation Problems from the Technical Standpoint in a Concentration of German Forces and their Supply for the Repulse of Hostile Landings in the Fall of 1942 in the Various Areas within the Jurisdiction of OB Süd.

A. Balkans

1.) Greece

a) The Saloniki area:

From Belgrade there existed only one line to Saloniki which was single-tracked most of the way. Despite construction to improve it, started immediately after the occupation of Serbia, it had a low capacity in the fall of 1942.

b) The region of Athens and Pelopponesus:

The line from Saloniki to Athens in peace time handled only a limited amount of the freight traffic of the country, since the bulk of that traffic fell to coastwise shipping. The work of improving it consumed a great deal of time and huge quantities of material because of the serious difficulties encountered with trass. In the fall of '42 necessary supplies could be brought

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In recapitulation, therefore, it can be stated that to concentrate German forces of any considerable size in the region of Saloniki would have required a long time. In the region of Athens substantially more time would have been necessary.

Current supply requirements and the movement of replacements would have involved no problems.

2.) Adriatic coast of Yugoslavia

The railways leading to the coast were not usable after the occupation of Yugoslavia as no troops were available for employment against guerrilla bands. Furthermore, there were only very few roads opening up the coastal region and the hinterland to the railroads. It would, therefore, have been impossible to effect a rapid concentration of any considerable forces on the Adriatic coast of Yugoslavia and current supply requirements could have been met only with very great difficulty.

B. Italy

1.) Southern Italy; the "Heel"; Region around Bari.

To concentrate troops in any considerable force in this region there are available, as far as the line Naples - Foggia, the eastern line and the two western lines. Because of the low carrying capacity of the eastern line, it can be left out of consideration, as the prospects for some time yet to come were that it could handle only a very small number of trains.

By severely throttling other traffic, a number of divisions might be moved to Naples over the two western lines. Problems would present themselves in routing them around Rome or slipping them through the city.

The lines leading from here to the south and southeast have a very low carrying capacity. Only those units could be moved over them that could not be moved by marching.

In recapitulation, therefore, it can be stated that to concentrate German forces of any considerable size in the region of Saloniki would have required a long time. In the region of Athens substantially more time would have been necessary.

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Summing up it can, therefore, be stated that the railway system of southern Italy precluded a rapid concentration of any sizable bodies of troops.

Moreover, maintenance of supply of a large scale combat would have run into serious difficulties.

No rail movement could have been carried out unless we had control of the air to protect rail and highway traffic.

2.) Rome and Naples

Here too the two main lines on the west coast and in the interior were available.

By severely cutting down other traffic and requisitioning every means of operating, strong forces could be maintained in these regions.

The net result was decidedly influenced by the question of control of the air and the extent to which other traffic was reduced.

As the system of highways into these regions was better developed, movements could be effected at a higher tempo (provided, of course, that supplies of fuel were adequate) by detaining some elements in the rear around Genoa, Bologna and Rimini.

Current supply demands could always be met even if the enemy held great superiority in the air at the time.

3.) Region around Genoa

It was possible to effect a rapid concentration of sizable troop units around Genoa, and it was always possible to meet current supply requirements.

The transportation situation was affected here too by the air control factor.

C. Southern France

In the fall of 1942 it was possible rapidly to concentrate large formations of troops on the French Mediterranean coast. To

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[signed:] Karl Thodor K o e r n e r

Translated by:

Howard F. K. Cahill
Lt. Col., Inf.

March, 1948