Declassified E.O. 12356 Section 3.3/NND No. 785019

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TERNI, GENERAL INFORMATION
JUNE 1944

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~~UNIONE ESERCIZI ELETTRICI~~

TERNI

GENERAL

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GENERAL

INFORMATION

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THIS FOLDER
CONTAINS PAPERS
FROM
TO JUN 44
CATALOGUE.

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TERNI - SOCIETA' PER L'INDUSTRIA E L'ELETTRICITA'

DIREZIONE GENERALE

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" T E R N I "

SOCIETA' PER L'INDUSTRIA E L'ELETTRICITA'

Capitale Sociale L. 1.500.000.000

Direzione in Roma - Via Due Macelli N.66

The Company's managing staffs are the following :

1 -) The Managing Board, having all powers ascribed to Board of Directors, and composed of :

- Prof.Dott.Ing. GIROLAMO IPPOLITO (Board President)
- Dott.Ing. DOMENICO DE SIMONE
- Prof.Dott.Ing. BASILIO FOCACCIA
- Dott. LUIGI BIXIO (Board Secretary)

2 -) The Central Rome Management, composed of the following two Company's Central Directors :

- Dott. LUIGI BIXIO
- Dott.Ing. EDOARDO BOCHICCHIO.

The Company's factories are placed in the provinces of Terni, Rieti and Perugia.

Materials produced by the Company before germans took to pieces and brought away most of the plants, were the following :

a) - <u>electric power</u>, produced in the power stations placed in Galleto, Papigno, Cotilia, Cervara, Preci,

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Marmore and Collestatto. These stations had a yearly output of 1,250,000,000 kWh, and a total power of 324.000 KVA;

b) - Iron and steel products : the steelworks, placed in Terni, could manufature yearly 150,000 tons of Martin steel and 60,000 tons of electric steel. This steel was used in the manufacturing of big and medium sized forged pieces, pressed pieces for various uses, various commercial bars, thick and medium sized plates, common and magnetic thin plates, tin plates, locomotive and railway carriage wheels,steel castings especially in big pieces for ships, motors and electric engines, etc.;

c) - Chemical products : the Nera Montoro works could produce yearly :

- 45,000 tons of ammonic sulphate
- 42,000 " " calcium nitrate
- 24,000 " " ammonic nitrate
- 8,000 " " synthetic methylic alcohol
- 6,000 " " concentrated nitric acid;

The Papigno works could produce yaarly :

- 200,000 tons of calcium cyanamid
- 25,000 " " calcium carbide
- 1,000 " " dicyandiamid

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d) - Cement : the cement manufacturing plant near Spoleto could produce yearly :

- 130,000 tons of cement
- 30,000 " " hydrated lime;

e) - Excavation of xyloid lignite : the many active mines can give a yearly output of about 860,000 tons of lignite, having an average calorific power of 3,000 calories.

Until June 4, 1944, when war events severed the Rome Management from the works, damage owed to air raids and to removals carried out by germans, had reduced the steelworks' output to 25% of above mentioned figures; Nera Montoro works' output to 20%, and Papigno works' output to 50% of above mentioned figuras.

The plants producing electric power, cement and lignite, had not yet been impaired.

All this is of course said prescinding from damage eventually caused by retreating german troops.

Moreover, independently of this, resumption of production, even on the above mentioned reduced scale, is only possible if supplies can be provided of what follows :

- mean raw materials, viz. : electric power, coal, dolomite, magnesite, pyrites, etc.;
- various wasting materials, viz. : electrodes, lubricant oils, platinum, copper, etc.;

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- means of conveyance, according to details that the "Società Terni" purposes handing over after having ascertained, for each factory and plant, what has remained after the withdrawal of german troops.

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INFORMATION ON THE IRON-AND STEEL WORKS

20th/6/1944

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SIDERURGICAL PLANTS OF "SOCIETA' TERNI"

IN TERNI

GENERAL INFORMATION

The Iron Works in Terni are formed by a principal unit (Acciaierie = Steel works) situated at North-East of the town (almost a distance of 1 km. from same) on the road that leads towards the high valley of the Nera river, and by another secondary unit (Fonderia Ghisa = cast iron foundry) in Terni near the railway station.

The two units cover a total area of abt. 900,000 m^2.

The activity of these units has been chiefly directed to the production of quality and alloy steels generally, for war and commercial uses.

Before bombardments and german occupation, the siderurgical plants in Terni, having, of course, at their disposal, the necessary raw materials, were able to supply per year :

- 150,000 m. tons Martin steel of common, commercial and quality types;
- 60,000 m. tons electric steel for quality products ;
- 100,000 m. tons section-irons in several types (beams, angle-irons, round bars, flat bars,

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- 150,000 m. tons Martin steel of common, commercial and quality types;
- 60,000 m. tons electric steel for quality products ;
- 100,000 m. tons section-irons in several types (beams, angle-irons, round bars, flat bars, billets);
- 12,000 m. tons armour plates and little plates for tanks and protective materials in general;

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- 20,000 m.tons thick and middle plates, chiefly for boilers, ships and of the Ni-plate type;
- 20,000 m.tons thin-sheets of common and magnetic types for engines and transformers;
- 10,000 m.tons tinplate;
- 10,000 m.tons large, middle and small forgings materials war and commercial products;
- 3,500 m.tons iron and duraluminium drop-forged products;
- 9,000 m.tons locomotive and railway-carriage wheels;
- 45,000 m.tons large sized iron-castings for naval purposes, engine equipment and electrical machines;
- 20,000 m.tons perforating and high blasting shells and aircraft bombs;
- 3,000 m.tons air-reservoirs for torpedos;
- 30,000 m.tons moulded cast-iron pieces for engines, piping and ingot-moulds;
- 18,000 m.tons refractory products for all siderurgical purposes.

The steel production obtained in Terni in the last years represented approximately, as weight, the 10 % of total italian one.

These plants kept busy almost :

- N. 800 employees

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- 10,000 m.tons tinplate;
- 10,000 m.tons large, middle and small forgings materials war and commercial products;
- 3,500 m.tons iron and duraluminium drop-forged products;
- 9,000 m.tons locomotive and railway-carriage wheels;
- 45,000 m.tons large sized iron-castings for naval purposes, engine equipment and electrical machines;
- 20,000 m.tons perforating and high blasting shells and aircraft bombs;
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The steel production obtained in Terni in the last years represented approximately, as weight, the 10 % of total italian one.

These plants kept busy almost :

- N. 800 employees
- " 10,000 workmen.

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A =) INFORMATION ABOUT PLANTS

Before the geraan occupation the features of thè plant were the following :

- 1) Steel production section -
the plant included :

- 8 Martin-Siemens furnaces of various capacity for a total monthly production of 14.000 m.tons;

- 6 electric three-phase are furnaces for a total monthly production of 5,000 m.tons.

- 2) Steel transformation section

a) - Forging

- large forging plant supplied with 3 presses for 12.000 5,000 and 2,500 tons respectiv. and with horizontal draw-plate for 2,000 tons;

- middle and small forging plant supplied with 5 presses varying from 1,500 tons to 600 tons and several hammers;

- drop-forging section supplied with 4 pneum. drop-forging hammers (2 up to 35,000 Kg.m., 1 up to 13,000 Kg.m., 1 for 4,500 Kg.m.) with necessary outfit;

- locomotive and vehicle wheel plant supplied with a press for 1,500 tons and a rolling-mill;

b) - Rolling section

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- large forging plant supplied with 3 presses for 12,000 5,000 and 2,500 tons respectiv. and with horizontal draw-plate for 2,000 tons;
- middle and small forging plant supplied with 5 presses varying from 1,500 tons to 600 tons and several hammers;
- drop-forging section supplied with 4 pneum. drop-forging hammers (2 up to 35,000 Kg.m., 1 up to 13,000 Kg.m., 1 for 4,500 Kg.m.) with necessary outfit;
- locomotive and vehicle wheel plant supplied with a press for 1,500 tons and a rolling-mill;

b) - Rolling section

- rolling-mill for armour-plates and large plates with m/m 3,000 table and rolling power for ingots up to 100 m.tons;

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- middle plates rolling-mill with m/m 3,400 table.

= Section-irons

a) a 750 blooming with a production power of 350÷400 m. tons a day;

b) a 750 rolling-mill for several section-irons with a prod.pow.200÷250 m.tons a day;

c) a 550 rolling-mill for several section-irons with a prod.pow. 200÷250 m.tons a day;

d) a 300 rolling-mill for small section-irons with a prod. pow. 160÷200 m.tons a day;

e) a 280 rolling-mill for small section-irons with a prod.pow. 50÷60 tons a day;

f) plant for most usual and magnetic thin sheets fabrication up to a loss.of 1 W/Kgr., supplied with two hot rolling-mills, 6 gates and with a cold rolling-mill, the latter for 2,500 m.tons power, with the whole accessory outfit for heat-treatment, pickling and finishing;

g) tin plate fabrication plant supplied with 4 mills (welsh type) with the whole accessory machinery outfit for a monthly 800÷900 m.tons production;

c) - Molten-iron castings

shops mostly equipped for big castings fabrication up to 300/350 m.tons total monthly production

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prod.pow.200÷250 m.tons a day;

c) a 550 rolling-mill for several section-irons with a prod.pow. 200÷250 m.tons a day;

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g) tin plate fabrication plant supplied with 4 mills (welsh type) with the whole accessory machinery outfit for a monthly 800÷900 m.tons production;

c) - Molten-iron castings

shops mostly equipped for big castings fabrication up to 300/350 m.tons total monthly production;

- 3) Shells section

a) - perforating shells for all the kinds of naval calibers and perforating bombs, up to 10 shells of the heaviest caliber and 100 shells of the middle caliber daily production;

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b) - high-blasting raw-shells fabrication up to 6,000 - 7,000 pieces daily production including the finishing of them up to 500 ÷ 600 shells a day;

- 4) Heat treatment section

Owing to the quality steels large production, heat treatment plants covered a very extensive area including

- 20 gas-furnaces 200 m.tons every one (with exhaust-gas recovery);
- 60 electric furnaces of different sizes and power from 100 up to 3,000 KW for an installed total power of 45,000/50,000 KW.

- 5) Steel cold-working section

Mechanical workings included several shops of heavy and middle mechanics arranged into large sheds for a total area of 40,000 mq., and including almost 500 tool-machines with a tools-work shop and relative fittings. There were also a moulding and a grinding unit supplied with 4 presses from 2,000 tons up to 6,000 tons and a straightening machine for plates up to mm.30.

- 6) Cast-iron foundry

This was equipped for cast-iron castings of second melting for machinery parts and mostly for water pipes of any diameter and for the necessary fittings devolved to the working in the plant, ingot-moulds included.

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- 20 gas-furnaces 200 m.tons every one (with exhaust-gas recovery);

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- 7) Studies and testing materials laboratories

Material testing laboratories were equipped with 20 machines for mechanical and technical testing with annexed shop for the test-bars.

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Laboratories for studies were supplied with modern installations for macro, microscopic and structural researches.

Chemical laboratories could do almost, 1,000 determinations a day for products, by-products and raw-materials.

There were also three induction furnaces for steel melting and several experimental furnaces.

- 8) Auxiliary services

These included :

a) - gas production by gasification of lignite, mostly from the Company's mines (yearly 450,000 tons of lignite and 30,000 tons of pit-coal);

b) - manufacturing of refractories including a factory for silico-aluminous fire-bricks and another one for siliceous products (Dinas type) for a total production of 18,000 m. tons a year ;

c) - electric and hydraulic power distribution.
Electric energy distribution included 9 principal converting stations and other secondary ones for an installed power of 74,000 KVA.
Water for impelling power, coolings and washings was

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c) - electric and hydraulic power distribution.
Electric energy distribution included 9 principal converting stations and other secondary ones for an installed power of 74,000 KVA.
Water for impelling power, coolings and washings was provided through a 18 atm. network fed by the Velino river;

d) - stores;

e) - reperation work - shops;

f) - sanitary and hygienic plants, etc.;

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There was also a plant in costruction for the production of cast-iron from mineral; this plant included three electric threephase furnaces of 15,000 KVA each with a total daily production of almost 250 m.tons cast-iron.

One of these furnaces was working, the two others were to be finished.

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B =) BRIEF INFORMATION ABOUT SUPPLY SOURCES

For the most part, raw-materials and other various consumption materials were provided from North-Italy and namely :

- part of the raw cast-iron, iron mineral, Fe-alloys, electrodes for melting furnaces;
- foundry sands, dolomite, graphite;
- lubrificating and quenching mineral oils;
- isolating lacquers and varnishes for ingot moulds;
- various store-materials for electric equipment and engine repairs in general;
- timber, wood, etc.

Raw materials and various materials coming from central and southern Italy, were the following :

- part of the raw cast-iron;
- lignite coming from the Company's mines, as formerly mentioned;
- electric energy coming from the Company's electric stations for a monthly total of 10,000,000 kWh;

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- lignite coming from the Company's mines, as formerly mentioned;
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- lead;
- fire-clays, kaolins, cements, bricks, lime, calcium carbide, etc.

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From abroad were imported the following raw-materials :

- alloying metals, Sn., Cu., Ni, and several other metals;
- pit coal, graphite for special purposes;
- chrome mineral, magnesite;
- palm oil.-

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- chrome mineral, magnesite;
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REMOVAL OF MACHINERY AND CONSEQUENT RESTRICTIONS OF PRODUCTION CAPACITY OF STEEL-PLANT OF "SOCIETA' TERNI" IN TERNI

- 1) REMOVAL

During the period of German occupation (which had its beginning from september 1943), by the germans had been removed the greatest part of the plants of the work and with these, nearly all supplies and part of the stored products.

The principal plants removed are the following:

- the whole plant ot six melting electric furnaces (4 up to 25 m.tons and 2 up to 9 m.tons);
- the whole plant of induction high-frequency electric furnaces for steel melting;
- horizontal draw-plate for 2,00 m.tons with annexed press up to 2,500 m.tons with their driving engine and hydropneumatic accumulator;
- 6 forging presses from 600 up to 1,600 m.tons with their

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- 6 forging presses from 600 up to 1,600 m.tons with their driving engine and hidropneumatic accumulator;
- the whole plant for the drop-forging of the steel and duraluminium including 4 Béchè pneumatic hammers (2 up to 35,000 Kg.m.; 1 up to 13,000 Kg.m;1 up to 4,500 Kg.m.)
- 7 various hammers from 150 Kg. up to 500 Kg.and 2 burr removing presses respectively for 1,500 and 1,000 tons;

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- hydropneumatic pumps and shop to actuate shells drawing;
- section-irons 750 finishing mill;
- 750 blooming mill;
- the whole plant for thin-sheets cold lamination;
- 300 various tool-machines of latest and most efficient type;
- the whole plant of three electric arc 15,000 KVA furnaces, for iron-minerals reduction, equipped with gas depuration and agglomerating plants and accessories;
- six Köller gas producers, entirely;
- sheds, for cold rolling plant, for a part of mechanic and middle and small forging works for a total area of 15,000 m^2;
- several machines for mechanical testing and scientific laboratory apparatus;
- electric furnaces of various sizes for heat treatment;
- travelling-cranes, transformers and electric engines of various power.

A part of this machinery, although out of plant, might be recovered, having probably not yet reached northern

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- II) DAMAGES SUFFERED BY THE IRON WORK IN CONSEQUENCE OF AIR BOMBARDMENTS -

Besides the removal of machinary performed by german troops, the work was considerably damaged, specially in the buildings, in consequence of air raids.-

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- III) PRESUMED PRODUCING POSSIBILITIES OF THE IRON WORKS -

Leaving out of consideration any possible further removal and damaging owing to the passage of the war in the zone of Terni, the following plants of the Iron Works could be (only partially) restored wirthin a few monthe :

- Martin steel ingots production
- steel castings
- large and middle plates
- forgings of some types and sizes
- locomotive and vehic, wheels
- metallic carpentry works
- vehic. repair
- refractories and brick manufacturing.

This partial possibility of resumption of work, is subject, of course, to a great assistance in the field of transports and to the supply of raw-materials.

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- IV) PRODUCTS, CONSUMPTION MATERIALS AND RAW-MATERIALS LAYING IN THE STORES OF " TERNI " STEEL PLANT -

For these materials exact weights entries are missing. By a rough calculation it may be assumed the following data:

- a) Stock products

steel-ingots (for the most part carbon steels)

nearly		m.tons	15 ÷ 20,000
section-irons	nearly	" "	1,000
plates	"	" "	1,500
cast-iron pipes for water piping	"	" "	5,000

- b) Half-finished a-building products

perforating shells
bombs for aircraft
pieces of ordnance
railway-carriages wheels
spare parts for ships propelling engines

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- b) Half-finished a-building products

perforating shells
bombs for aircraft
pieces of ordnance
railway-carriages wheels
spare parts for ships propelling engines

- c) Raw-materials

pit-coal	nearly	m.tons.	8,000
lignite	"	" "	5,000
scrap-iron and cast-iron scrap	"	" "	20,000

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INFORMATION ON THE ELECTROCHEMICAL WORK AT

N E R A M O N T O R O

20th/6/1944

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ELECTROCHEMICAL PLANT FOR SYNTHETIC AZOTIZED AND METHYL ALCOHOL PRODUCTION SITUATED IN NERA MONTORO

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GENERAL NOTE

The electrochemical plant situated in Nera Montoro on the right side of the river Nera near the railway station in the commune of Narni has been brought up to his actual structure by successive amplifications.

At the beginning, before the plant were transferred in the property of "Società Terni", it had been installed in it the machinery for the utilization of electric power, produced by the electric station in the zone for the fabrication of electrolytic hydrogen and therefore for the synthetic ammonia.

This ammonia was in the follow completely transformed in ammonium sulphate.

Afterwards by the raising of carbide and calcium cyanamide fabrication in Papigno and with the necessity of high amounts of coke was decided the installation of the cokerie; in order to devolve the gas to the ammonia and the coke obtained, to the carbide fabrications.

By following amplifications and integrations in order

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By following amplifications and integrations in order to normalize and to balance the activities of every department of the plant and first of all to satisfy the rising requests of the fertilizers and methyl alcohol, the plant was

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amplificated by installation of the following machinery for :

- other gas production;
- larger ammonia quantities production;
- large quantities of methyl alcohol production;
- nitric acid and nitrates fabrication.

By the installations of which this plant could dispose before beginning the dismounting of the machinaries by the German Authorities it was able to produce :

- 100 M.tons ammonia/day
- 30 " " methyl alcohol/day
- 150 " " ammonium sulphate 20/21 - N_2 / day
- 140 " " calcium nitrate 15,5 N_2 / day
- 80 " " ammonium nitrate 15/16 N_2 / day

alternating with :

- 35 m.tons ammonium nitrate pure / day
- tons products of minor importance.

The N_2 Production power of Nera Montoro plant represented almost the 20 % of total Italian one. Therefore really owing to the deficiency of electric power and also for fuels defective supply the actual production of the plant is always remained below the real production capacity.

This and the effectual production of methyl alcohol

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alternating with :

- 35 m.tons ammonium nitrate pure / day
- tons products of minor importance.

The N_2 Production power of Nera Montoro plant represented almost the 20 % of total Italian one. Therefore really owing to the deficiency of electric power and also for fuels defective supply the actual production of the plant is always remained below the real production capacity.

This and the effectual production of methyl alcohol of the plant represented on the contrary more than the 50% of that total Italian one.

The plant disposed of almost 160 employees and 2,000 workmen.

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A =) INFORMATIONS ABOUT THE PLANT

Before German occupation this plant was provided with the following installations for the most part lately builded :

- 1) Installation for electrolytic hydrogen production
  For a power almost of 60,000 m3/day of this gas;

- 2) Installation for gas and coke production
  a) - furnaces assembling for 270 m.tons/day of pit-coal distillation corresponding to 180 m.tons, coke and 120,000 m3 gas;
  b) - two gas producers for the production of 90,000 m^3 water gas for a total quantity of 70,000 m^3 gas/day;
  c) - three gas producers having a daily output of 70,000 cub.meters of water gas;

- 3) Installations for ammonia and methyl alcohol production
  a) - converting high pressure installation for 120,000 m^3/day water gas;
  b) - converting low pressure distillation installation for 120,000 m^3/day water gas;
  c) - gas decomposing installation, with production of

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the following installations for the [illegible]

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b) - two gas producers for the production of 90,000 m^3 water gas for a total quantity of 70,000 m^3 gas/day;

c) - three gas producers having a daily output of 70,000 cub.meters of water gas;

- 3) Installations for ammonia and methyl alcohol production

a) - converting high pressure installation for 120,000 m^3/day water gas;

b) - converting low pressure distillation installation for 120,000 m^3/day water gas;

c) - gas decomposing installation, with production of ammonia and methyl alcohol mixture;

d) - synthesis installation consisting of ten synthesis unities for a total power 130 m.tons ammonia day and four synthesis unities for the methyl alcohol for a total power 52 m. tons/day;

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e) - methyl alcohol distillating installation to rectificate and dehydrate;

- 4) Sulphuric acid installation

a) - three lead chamb.installations for total production of 136 m. tons/day of sulphuric acid 65%;

b) - a tower installation to be assembled for 40 tons/day production of sulphuric acid 97%;

- 5) Nitric acid installation

a) - two nitric acid installation for 180 m. tons/day total production of nitric acid 53%;

b) - an installation for 160 m. tons/day; these installation work at 7 atm. pressure;

c) - installation for 30 m. tons/day production of nitric acid 100%;

- 6) Ammonium sulphate installation

a) - three unities for a total of 300 m. tons/day production;

- 7) Calcium nitrate installation

a) - three unities for a total production of 180 m. tons/day calcium nitrate;

b) - limestone quarry of 200 m. tons/day power in limestone;

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- 7) Calcium nitrate installation

a) - three unities for a total production of 180 m. tons/day calcium nitrate;

b) - limestone quarry of 200 m. tons/day power in limestone;

- 8) Ammonium nitrate installation

a) - installation for the production of 35 m. tons/day of pure ammonium nitrate;

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b) - installation for the production of 80 m.tons/day of ammonium nitrate 15/16 N_2;

- 9) Installation of special solvent named "Ter solvent"

a) - Four unities for the production of 2,000 Kg/day of "Ter solvent";

- 10) Installatium of strontium nitrate production

a) - installation for Kg. 400/day power;

- 11) Storage and shipment of goods installations

a) - Methyl alcohol - 5 containers 250 mc. everyone

b) - Benzene - one container 250 mc.

c) - Concentrated nitric acid - two containers 150 mc. power;

d) - Ammonium sulphate - 20,000 m.tons, power of product stored in bulk;

e) - Ammonium nitrate 15/16 N_2 - 20,000 m.tons/power of product stored in bulk;

f) - Calcium nitrate - 20,000 m.tons, power of packed stored product;

g) - four sacking unities for filling up of 150 sacks/h;

h) - siding directly collected with the statal railway system near Nera Montoro station.

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g) - four sacking unities for filling up of 150 sacks/h;

h) - siding directly collected with the statal railway system near Nera Montoro station.

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B =) SUPPLIES

The electric power, raw materials and other necessary various materials supplies for plant activity came from the following sources :

- 1) Electric power - from electric station of Terni's same Society directly collected with the plant;

- 2) Pitcoal for coke fabrication - in normal periods from English mines of Yorkshire and Durban; recently from High Silesia and from the Ruhr;

- 3) Pyrites for sulphuric acid fabrication - from Gavorrano mines of "Società F.lli Marchi" in Florence and from "Società Montecatini" and from the mines near Civitavecchia of "Società Stima";

- 4) Caustic soda for air and gas depuration - was supplied from "Società Solvay" of Rosignano;

- 5) Lubricants - the various lubricating oils for motors, high temperature compressors and for refrigerator installations were previously supplied from "Società Emilio Foltzer" in Genoa and from Vacuum Oil Company in Genoa and recently only from the A.G.I.P.;

- 6) Caustic potash-necessary for the electrolyte preparation for hydrogen production - was supplied from "Società Nord

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- 6) Caustic potash-necessary for the electrolyte preparation for hydrogen production - was supplied from "Società Nord Italia";

- 7) Paper sacks for the product packing - jute sacks lined with bituminized paper were supplied from "Società Emilio De Magistris" in Milan - from "Consorzio Produttori

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Sacchi" in Milan, from "Soc.An. Natrocellulosa" in Milan; from "Società Vincenti e Armeni" in Terni; the bitumized paper sacks were supplied from "Società Anonima Emilio De Magistris" in Milan, from "Consorzio Produttori" in Milan, from "Società Anonima Natrocellulosa" in Milan; from the "Sacchi Cemento e Affini - A.S.C.A."- in Rome.

- 8) Limestone - the limestone for the calcium nitrate fabrication and for ammonium nitrate dilution was directly supplied from the quarry situated near the plant;

- 9) Explosive - fuses and caps for limestone mine working from "Ditta Polverifici Stacchini" in Rome.

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C =) A SUMMARY TABLE OF PRODUCTIONS AND OF NEEDED AMOUNTS OF ELECTRIC POWER, RAW MATERIALS AND PRINCIPAL CONSUMPTION MATERIALS -

For a presumed production yearly of :

- Ammonium sulphate	m.tons.	45,000
- Calcium nitrate	" "	42,000
- Ammonium nitrate	" "	24,000
- Methyl alcohol	" "	8,000
- Concentrated nitric acid	" "	6,000

were required :

- Electric power		kWh.	130,000,000
- Coal		m.tons.	138,000
- Pyrites		" "	27,000
- Platin		kg.	8,8
- Lubricants		m.tons.	85
- Caustic soda		" "	800
- Caustic potash		" "	80
- Explosive :	dynamite	" "	6
	fuse	l.m.	22,000
	caps	n.	10,000

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MATERIALS AND PRINCIPAL CONSUMPTIONS

MATERIALS -

For a presumed production yearly of :

- Ammonium sulphate	m.tons.	45,000
- Calcium nitrate	" "	42,000
- Ammonium nitrate	" "	24,000
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- Lubricants		m.tons.	85
- Caustic soda		" "	800
- Caustic potash		" "	80
- Explosive :	dynamite	" "	6
	fuse	l.m.	22,000
	caps	n.	10,000
- Sacks of a quintal everyone		"	1,110,000

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ELECTROCHEMICAL ESTABLISHMENT OF NERA MONTORO

Asportatation of machinery and subseguent limited possibility of production -

I - ASPORTATIONS

According to the news that reached us since June 4, we are now able to produce a first summary list of the machinery asported by the German troops already before the interruption of the comunications with the Establishments.

The machines asported are the following ones :

a) - a complete set of machines for the decomposition of 5800 mc/h of gas into hydrogen, methane and carbonic oxyde;

b) - a complete set of machines for the decomposition of 8,000 mc/h of air intonitrogen and oxigen;

c) - a turbine compressor having a potential of 20,000 mc/h at 7 atm.;

d) - 24,875,77 gr. of platinum in nets necessary for the oxydation of ammonia.

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d) - 24,875,77 gr. of platinum in nets necessary for the oxydation of ammonia.

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II) - DAMAGES CAUSED TO THE ESTABLISHMENT BY AIR-RAIDS

Since April 12 the buildings and the machinery of the Establishment have been slightly damaged in consequence of repeated air-raids.

Particularly the following parts have been hit :

- one of the rooms of the gas decomposition, with slight damages to the machinery;
- one of the sheds, in which electrolytic hydrogen was produced, with slight damages to the electrolyzers;
- a dry gazometer for azote damaged by machine-gun fire;
- probably the cabin for transformation of electric energy.

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- probably the cabin for transformation of electric energy.

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- III) PRESUMABLE IMMEDIATE POSSIBILITIES OF PRODUCTION

Provided that the electric centrale can still supply electric energy and that no new destructions have been made by the withdrawing German troops or by new air-raids after June 4, the following immediate works ought to be possible in the Establishment.

In about one month one should be able to resume the production of about 20 tons of ammonia daily, which could be transformed into 75 tons of sulphate of ammonia daily, if one succeeded in getting supplies of pyrites.

At the same time one might start a reduced production of methyl alcohol, in a quantity of about 10 tons daily.

These two productions could be increased later on.

All the same it is very difficult to-day to establish exactly into which products one will be able to transform the ammonia if it will be possible to appoint it for the production of a sulphate (we have already mentioned that an adequate supply of pyrites would be necessary in that case), or whether it could be employed for the production of nitrates. (Nitrate of ammonia and nitrate of calcium).

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The latter product absolutely requires nitric acid, but probably at least five months will be necessary for again putting into efficiency the machines which

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produce the acid, as the whole machinery has to be newly mounted.

For the production of this acid it is also necessary to get supplies of new platinum nets, to substitute the ones that were taken away by the Germans. These nets are made by a special factory in Rome, but there is no platinum-rhodium, of which at least 10 Kg. ought to be supplied at once.

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IV) - RAW MATERIALS AND CONSUMING MATERIALS STORED UP AT THE ESTABLISHMENT -

It will be possible to give more exact informations only after having paid a visit to be the establishments, which is to be done as soon as possible.

Anyway we can point out the following reserves, which were existing at the Establishment before the interruption of the comunications :

- methyl alcohol	about	200	m.tons
- ammonium sulphate	"	800	" "
- ammonium nitrate	"	180	" "
- calcium nitrate	"	5,000	" "

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INFORMATION ON THE ELECTROCHEMICAL WORK AT

P A P I G N O

20th/6/1944

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ELECTROCHEMICAL WORKS FOR THE MANUFACTURING OF CALCIUM CARBIDE AND CYANAMID, PLACED IN PAPIGNO -

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GENERAL NOTE

These works, placed along the river Nera near the village called Papigno (which is part of the town of Terni) at 4 km. from the town itself, have been built with a view to assign to the manufacturing of calcium carbide and cyanamid the huge amount of electric power coming from this Company's electric plants, which is available particularly during flood season, as well as during the one of less customers' consumption.

At the same rate with the increase of electric plants and fertilizer request, these works have been progressively enlarged up to a yearly output (in 1942) of about 200,000 tons of 15/16% N_2 cyanamid, and 25,000 tons of calcium carbide devoted to free trade.

Of course, so great an output is obtainable only during the years of heavy rain, which brings an adequate amount of electric power.

On the average instead, besides 25,000 tons of calcium carbide, one could rely on a yearly output of about 130,000 tons of 15/16% N_2 cyanamid.

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The cyanamid output was anyhow more than 60% of Italy's whole home output.

These works could also manufacture 1,000 tons per annum of dicyandiamid ($H_4C_2N_4$), a derivative of calcium cyanamid.

In normal periods about 80 technical and administrative employees, and about 1,800 hands worked in these Electrochemical Plants.

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In normal periods about 80 technical and administrative employees, and about 1,800 hands worked in these Electrochemical Plants.

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A =) PLANT DATA

Before German occupation these works were furnished with the following plants, all of new construction :

- 1) Lime manufacturing plant
  - a) - 4 brick-built lime-kilns, each having a 100/120 ton daily output;
  - b) - 6 lime-kilns with a sheet iron covering, each having a 35 ton daily output;

- 2) Calcium carbide manufacturing plant
  - a) - 3 furnaces having a total daily output of 330 tons;
  - b) - 1 furnace having a 40 ton daily output;

- 3) Calcium carbide packing plant
  - a) - A shattering and classing plant, for the classing of carbide in six commercial sizes, and the filling of 50 Klo. barrels; having a 5 ton output per hour;
  - b) - an installation for the manufacturing of metal barrels having a capacity of 50 Klos. of carbide. This installation has an output of 110 metal barrels per hour.

- 4) Air oxygen and nitrogen separation plant
  - a) - 4 units totalling a 2,500 nitrogen and a 700 oxygen cub. meter output;

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- 1) Lime manufacturing plant

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b) - an installation for the manufacturing of metal barrels having a capacity of 50 Klos. of carbide. This installation has an output of 110 metal barrels per hour.

- 4) Air oxygen and nitrogen separation plant

a) - 4 units totalling a 2,500 nitrogen and a 700 oxygen cub. meter output;

b) - 3 units totalling a 620 nitrogen and a 160 oxygen cub.meter output;

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- 5) <u>Plants for the extraction of cyanamid out of calcium carbide</u> -

a) - 550 carbide moulds, each having a capacity of 1,350 Klos.;

b) - 4 carbide shattering and grinding units, each made of :

- 1 reverser
- 1 feeder
- 1 large jaw crusher
- 1 roller mill
- 1 magnetic separator
- 1 finishing mill

c) - 210 small azotising furnaces, each having a daily output of about 3 tons of 15/16% N_2 cyanamid;

d) - 2 hammer crushers for the shattering of 12 ton cyanamid blocks;

e) - 3 mills for the grinding of cyanamid;

f) - 1 mill for the grinding of the diluent;

g) - many different carriers for the conveying of finished cyanamid to the warehouse;

- 6) <u>Plant for the extraction of dicyandiamid $H_4C_2N_4$ from calcium cyanamid</u> -

a) - A complete plant having a daily dicyandiamid

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b) - 4 carbide shattering and grinding units, each made of :

- 1 reverser
- 1 feeder
- 1 large jaw crusher
- 1 roller mill
- 1 magnetic separator
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e) - 3 mills for the grinding of cyanamid;

f) - 1 mill for the grinding of the diluent;

g) - many different carriers for the conveying of finished cyanamid to the warehouse;

- 6) <u>Plant for the extraction of dicyandiamid $H_4C_2N_4$ from calcium cyanamid</u> -

a) - A complete plant having a daily dicyandiamid output of 4 tons.

- 7) <u>Cyanamid storing and forwarding plant</u>

a) - A warehouse capable of 80,000 tons of 15/17% N_2 cyanamid, expressely built, having a remarkable

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capacity, in consideration of output and selling state;

b) - 6 sacking units, each having a sacking rate of 600 sacks per hour;

c) - a railway junction, belonging to the "Società delle Tramvie di Terni" (a firm controlled by the "Terni"), linking the warehouse to the national railway system. -

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b) - 6 sacking units, each having a sacking rate of 600 sacks per hour;

c) - a railway junction, belonging to the "Società delle Tramvie di Terni" (a firm controlled by the "Terni"), linking the warehouse to the national railway system. -

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B =) SUPPLIES

Electric power, raw and other materials needful to these works' activity come from the following sources :

- 1) Electric power - from the electric plants belonging to the "Terni" itself, placed in the immediate neighbourhood of the factory, and directly linked to it;
- 2) Limestone for the manufacturing of lime - from a quarry placed near the works;
- 3) Coke for the manufacturing of lime and calcium carbide - meanly from the coke-making plant of the Nera Montoro electro-chemical works, also belonging to the "Terni; and for the needful remainder, from the next Gas Works;
- 4) Electrodes -

a) - for the carbide-kilns, carbon electrodes are required, measuring 0,50 x 0,50 meters, and having a height of 2 m.;

b) - for the casting openings, carbon electrodes are also required, measuring 0,15 x 0,15 meters, and having a length of 1 ÷ 1,50 meters;

c) - for the manufacturing of calcium carbide, graphite electrodes are required, having a diameter of about 15 millimetres, and an engine of 5 [illegible]

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a) - for the carbide-kilns, carbon electrodes are required, measuring 0,50 x 0,50 meters, and having a height of 2 m.;

b) - for the casting openings, carbon electrodes are also required, measuring 0,15 x 0,15 meters, and having a length of 1 ÷ 1,50 meters;

c) - for the manufacturing of calcium carbide, graphite electrodes are required, having a diameter of about 15 millimetres, and an opening of 5 millimetres;

all these electrodes were supplied by factories placed in Narni and Ascoli Piceno, and belonging to the "Elettrocarbonium" Company;

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- 5) Lubricants -

- Oil, for cylinders and for movements in the nitrogen manufacturing plant;
- grease, for the mills
- machine-oil

these lubricants were lately supplied by the "A.G.I.P.";

- 6) Oil for the oiling of cyanamid - dense residua are employed for this purpose, coming from distillation of raw materials used in gasoline manufacturing. The above mentioned oils were supplied by the "A.G.I.P.", the "Aquila" Company of Trieste, and the "R.O.M.S.A." of Fiume;

- 7) Thin iron plates for metal barrel manufacturing - thin iron plates, 3/10 and 4/10 millimetres thick, for the manufacturing of barrels needed in packing of carbide devoted directly to free trade, were supplied by the Terni steel works, these also being a property of our firm;

- 8) Jute and paper sacks for calcium cyanamid packing - calcium cyanamid was usually packed in jute and water-tight paper sacks; in the last years, jute being impossible to get, it has been replaced with bituminized paper sacks alone; the sacks of jute-paper were supplied by the "Emilio De Magistris" Company of Milan, [illegible] Company of Milan, the Sack Pro-

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- 9) Caustic soda for air depuration - to remove carbonic acid contained in air (the latter having to be decomposed in oxygen and nitrogen), it is necessary to wash air in a caustic soda solution; soda was supplied by the Solvay Company, Rosgnano;

- 10) Copper for changing of conductors in furnaces - flexible conductors and electrode-holding pincers are made of copper blades and plates, liable to rapid waste; these parts were supplied to us mainly by the Italian Metallurgic Company, Florence;

- 11) Paper for calcium cyanamid retorts - calcium carbide, thinly ground to be held in the retorts made of bored fire-proof units, must be kept back by an inner paper lining of retorts; this paper was supplied by the "Emilio De Magistris" Company, Milan and by the paper-mill of Tarquinia;

- 12) Fluorine for the azotizing of carbide - fluorine (calcium fluoride) was used for right regulating of carbide azotizing, and it was supplied by the "Società Alto Atesina per Esplorazioni Minerarie", Trento (a mine sounding Company), and by the "Società Mineraria Prealpina" (pre-Alpine Mining Company), San Giovanni Bianco;

- 13) Cast iron for carbide moulds - moulds made to receive carbide, were supplied by the Terni foundries, also belonging to our Company;

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- 13) Cast iron for carbide moulds - moulds made to receive carbide, were supplied by the Terni foundries, also belonging to our Company;

- 14) Explosive for the limestone quarry - explosives, fuses and percussion caps, were supplied by the firm "Polverifici Stacchini", Rome.

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C =) RECAPITULATORY SCHEDULE OF OUTPUT AND OF CORRESPONDING AMOUNTS OF ELECTRIC POWER, RAW AND OTHER MAIN MATERIALS NEEDED -

A supposed yearly 15/16 % N_2 calcium cyanamid output of 130,000 tons, and a 25,000 ton calcium carbide output would need a supply of :

- Electric power	kWh.	380,000,000
- Limestone	tons.	150,000
- Coke	"	76,000
- Electrodes	"	2,500
- Lubricants	"	25
- Oil	"	3,900
- Thin iron sheet for barrel manufacturing	"	1,750
- 75 Klo. sacks	N.	1,750,000
- Caustic soda	tons.	60
- Copper	"	10
- Retort paper	"	40
- Fluorine	"	1,500
- Cast iron	"	150
- Explosive :		

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RAW AND OTHER MAIN MATERIALS NEEDED -

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- Oil	"	3,900
- Thin iron sheet for barrel manufacturing	"	1,750
- 75 Klo. sacks	N.	1,750,000
- Caustic soda	tons.	60
- Copper	"	10
- Retort paper	"	40
- Fluorine	"	1,500
- Cast iron	"	150

- Explosive :

dynamite	tons	12
percussion caps	n.	22,000
fuses	"	45,000

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ELECTROCHEMICAL WORK IN PAPIGNO

Asportation of machinery and consequently limited production possibilities -

- 1) ASPORTATIONS

On the base of reports received until 4th. June a.c. the Company are able to give a first approximate list of asportations already operated by the German armed forces before the interruption of the communications with the works.

The asported plants are the following :

a) - 3 units for the manufacturing of 620 m3 of N_2 per hour;

b) - 2 units for the manufacturing of 2,500 m3 of N_2;

c) - 1 complete carbide furnace with an output capacity of 110 tons per day;

d) - 1 complete carbide grinding and shattering plant;

e) - 1 complete carbide furnace with an output capacity of 40 tons per day;

f) - some important parts of a carbide furnace with an output capacity of 110 tons per day;

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c) - 1 complete carbide furnace with an output capacity of 110 tons per day;

d) - 1 complete carbide grinding and shattering plant;

e) - 1 complete carbide furnace with an output capacity of 40 tons per day;

f) - some important parts of a carbide furnace with an output capacity of 110 tons per day;

g) - copper, aluminium and asbestos for the carbide furnaces.

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- II) - <u>DAMAGE SUFFERED BY THE WORK OWING TO AIR RAIDS -</u>

On the 6th and 7th April a.c. the buildings of the works have suddered damage owing to air raids. Machinery has had less damage.

Specially hit have been :

a) - one of the azotising rooms of carbide;

b) - a certain number of furnaces for the azotising of carbide;

c) - the installation for the manufacturing of carbide drums;

d) - one of carbide furnaces of 110 tons;

e) - the dicyandiamid plant;

f) - the coke storehouse;

g) - the cyanamid storehouse;

h) - in a slighter way the other buildings.

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- III) - PRESUMED IMMEDIATE MANUFACTURING POSSIBILITIES

Provided that the electric power stations are still in a condition to supply electric power and provided that no further destructions have been operated by the retreating German armies or owing to new air raids, the immediate working possibilities of the work can be considered to be the following :

A - Within a month an electric furnace can be put into activity with which a maximum output of 100/110 tons carbide per day could be reached.
The duration of the activity of this furnace is, however, about 15 days only, as the work has only a very modest quantity of electrodes at its disposal.
The whole of this carbide output can be pocked in drums provided that in the time necessary to put into activity the furnace, it will be possible to reorganize the packing installation.
Should this not be possible, then the whole output of calcium carbide should have to be transformed into calcium cyanamid, provided, of course, that the Claude plant for the production of azote is still efficient.
It is also pointed out that the daily output of the furnace could, if necessary, be

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The whole of this carbide output can be pocked in drums provided that in the time necessary to put into activity the furnace, it will be possible to reorganize the packing installation.
Should this not be possible, then the whole output of calcium carbide should have to be transformed into calcium cyanamid, provided, of course, that the Claude plant for the production of azote is still efficient.
It is also pointed out that the daily output of the furnace could, if necessary, be considerably reduced if the circumstances should request it.

B - Of the utmost importance is the solution of the transport question.
The work is connected with railway station of Terni by means of a tram line which should be easily repai-

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rable, but the State Railways net north and south of Terni is interrupted.
Therefore the whole of the carbide and of the calcium cyanamid, both the new output and same on stock, will have to be transported to the places where these articles have to be used exclusively by means of motor vehicles.

C - Beyond this first kernel of plants, it is probable that in about 6 or 8 months a second furnace and a further aliquot of installations for the transformation of carbide into cyanamid may be repaired.
It will, however, be necessary to obtain a sufficient supply of electrodes and, later on, of coke of which we have a stock for about 1½ month for one furnace only.

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It will, however, be necessary to obtain a sufficient supply of electrodes and, later on, of coke of which we have a stock for about 1½ month for one furnace only.

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- IV) - MANUFACTURES, RAW MATERIALS AND AUXILIARY MATERIALS -

On the base of data relative to the situation before the interruption of communications with Terni, it is possible to indicate the following stocks :

- calcium cyanamid 15/16 N_2 abt. 20,000 tons
- calcium carbide in drums " 800 "
- coke " 3,000 "
- electrodes for 15 days for one furnace
- oil for the oiling of the output of 3 months.

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INFORMATION ON THE MINES

20th/6/1944

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LIGNITE MINES OF THE "TERNI" COMPANY

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GENERAL INFORMATION

Since more then 30 years the "Terni" Company have in exploitation several mines, most of which in Umbria, for the excavation of lignite.

These mines are situated in the following localities:

- Spoleto Mines - in the surroundings of the town of Spoleto with the principal yard at Morgnano;
- Branca and Padule Mines - in the localities called Branca and Padule, along the secondary railway Umbertide-Fossato di Vico near Gubbio;
- Collazzone Mines - in the locality Collazzone in the province of Perugia and near the village of Marsciano;
- Asmra Mines - in the homonymous locality near Poggio Mirteto;
- Colle dell'Oro Mines - near the railway station of the town of Terni.

Moreover the "Terni" Company are interested for 50% in the Società Termoelettrica Umbra, owners of the Gualdo Cattaneo (Bastardo) Mines, situated in the homonymous locality

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- Collazzone Mines - in the locality Collazzone in the provin-ce of Perugia and near the village of Marsciano;
- Agura Mines - in the homonymous locality near Poggio Mitteto;
- Colle dell'Oro Mines - near the railway station of the town of Terni.

Moreover the "Terni" Company are interested for 50% in the Società Termoelettrica Umbra, owners of the Gualdo Cattaneo (Bastardo) Mines, situated in the homonymous locality in the Province of Perugia and relatively near to the towns of Foligno and Spoleto.

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The mines of Spoleto, Aspra, Colle dell'Oro and Gualdo Cattaneo have been exploited with particular intensiveness in order to meet the need of coal of the iron-and Steel Works in Terni both during the war 1914-1918 and the present conflict.

During the last 5 years the "Terni" Company have also valorized the Branca and Collazzone Mines though they give a coal of a much inferior quality.

The lignite excavated from the above said mines is of the furf-xiloide type, containing a humidity varying, according to the yard of origin and the quality, between 30 and 45 % with an inferior calorific capacity varying between 2,500 and 3,500 calories.

The annual output obtainable before the german occupation was the following :

- Spoleto Mines : 280,000 tons of lignite such as it was
- Branca and Padule Mines: 200,000 " " " " " " "
- Collazzone Mines : 30,000 " " "" " " " "
- Aspra Mines : 25,000 " " " " " " "
- Colle dell'Oro Mines : 25,000 " " " " " " "
- Gualdo Cattaneo(Basterdo) 200,000 " " " " " " "

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The lignite excavated from the above said mines is of the turf-xiloide type, containing a humidity varying, according to the yard of origin and the quality, between 30 and 45 % with an inferior calorific capacity varying between 2,500 and 3,500 calories.

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- Branca and Padule Mines:	200,000	" " " " " " "
- Collazzone Mines :	30,000	" " " " " " "
- Aspra Mines :	25,000	" " " " " " "
- Colle dell'Oro Mines :	25,000	" " " " " " "
- Gualdo Cattaneo(Bastardo)	200,000	" " " " " " "

The principal difficulties opposing a regular and intense exploitation of the above named mines consisted in the distance of some of them from the railways so that for the coal excavated from some of the mines it was necessary to forward same by means of motor-trucks.

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The complete suspension of the railways traffic owing to attacks from the air and the growing crisis in the motorised transportation nearly completely paralyzed the mining activities of the "Terni" Company.

In periods of normal activity the lignite output of the "Terni" group amounted to about 25/30 % of the total Italian output of turf-xiloide lignite.

In the mines of the "Terni" group, including the Gualdo Cattaneo mines, an occupation was found by :

- 220 managers and clerks
- 7,000 workmen

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DETAILED INFORMATION ON THE MINES

1) - Spoleto Mines -

A layer estimated to be of about 10 million of tons of lignite of which 3 millions already located, is exploited here.

The lignite, the best among same extracted from all the mines of the "Terni", having a medium humidity of only 30 % and a calorific capacity of abt. 3,500 calories, was extracted in five yards and brought to two large excavation shafts each 360 m. deep and connected between each other both internally by tunnels and externally by cableways.

At the principal shaft a drying plant has been erected capable of delivering 140 tons of dried lignite in lumps with a residual humidity of 16-18 % per day.

The main yard of the mine, to which all lignite is conveyed for forwarding, is connected with the railway station of Morgnano di Spoleto by means of a Speciale junction.

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The main yard of the mine, to which all lignite is conveyed for forwarding, is connected with the railway station of Morgnano di Spoleto by means of a Speciale junction.

In May of this year, the activity of these mines was reduced next to zero, the only works done being same necessary for the upkeep of the galleries and the digging out of abt. 2,000 tons of lignite per month.

In normal times the mines in Spoleto could deliver 900/1,000 tons lignite per day.

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2) - Branca and Padule mines -

Here a layer estimated at abt. 10,000,000 tons of lignite, of which 2 millions already located, is exploited.

The lignite is very turfish, with a Humidity of abt. 40/45 % and a calorific capacity of abt. 2,500 calories.

The yard at Branca is by means of a cable-way, connected with the Branca station of the narrow gauge railway of the central Apennine which consents the transportation of the lignite by this way to the State Railway Station of Fossato di Vico.

The "Terni" were busy to provide themselves with special conveyors and by means of works at the railway parks of the Branca and the Fossato di Vico station in order to be able to carry the state railway waggons as far as the loading mill-hoppers of the cable-way at Branca, so as to avoid the transhipment of the lignite at the station of Fossato di Vico.

In this mine the excavation of lignite was realized by means of inclined tunnels from which, in normal periods, up to abt. 500 tons per day are extra

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In this mine the excavation of lignite was realized by means of inclined tunnels from which, in normal periods, up to abt. 500 tons per day are extracted.

The Padule yard delivering a lignite quality absolutely similar to same of Branca, as the same layer is concerned, was to be connected with the Padule station (always on the central Appennine railway) by means of a separate cable-way.-

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In this mine too the lignite was extracted by means of inclined galleries and in normal times an output of 200 tons per day could be reached.

Both at the Branca and at the Padule mines works had been begun for the construction of excavation and ventilation shafts and of furher inclined tunnels.

3) - Collazzone mines -

Here a bed estimated at abt. 1 ½ million tons of lignite, of which 300,000 tons already individuated, was exploited by means of a few inclined tunnels.

A very moist sort of lignite is concerned: humidity from 40 to 45 %.

This layer is of difficult exploitation as the galleries undergo considerable thrusts and infiltrations of water, so as to render the upkeep very expensive.

The yard is connected with the main road by means of a decauville and with the station of Marsciano, on the Central Umbrian Railway, running between Umbertide and Terni, by means of a special cable-way.

During the month of May, owing to the interruption of railway transportations, the railway having been damaged in several points, the Collazzone mine has been fully unpro-

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During the month of May, owing to the interruption of railway transportations, the railway having been damaged in several points, the Collazzone mine has been fully unproductive, as the work too has been limited to the strictly necessary for the upkeep of the main galleries.

In normal times this mine could give up to 100 tons of lignite per day.

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4) - The Aspra Mine

In this mine, by means of a few inclined tunnels a layer was exploited, which has been estimated at 1½ million tons of lignite, of which 300,000 tons already individuated.

The quality of the lignite is a mediocre one with much trash and friable with a humidity up to 50 % and with a calorific capacity round about 2,500 calories.

The extracted brown coal has to be carried by motor-truck to the State Railway Station of Poggio Mirteto, at a distance of about 17 km.

The State Railway not being efficient, and if one wants nevertheless to use this lignite, it will be necessary to convey it to the place of consumption by motor-trucks .

The mine was already since a few months unexploited but could, in normal times, put out abt.80 tons of lignite per day .

5) - The Colle dell'Oro mine

In this mine, by means of a few inclined tunnels, a layer was exploitedthat has been estimated at about 2 million tons of lignite, of which 300,000 tons already individuated.

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The State Railway not being efficient, and if one wants nevertheless to use this lignite, it will be necessary to convey it to the place of consumption by motor-trucks .

The mine was already since a few months unexploited but could, in normal times, put out abt. 80 tons of lignite per day .

5) - The Colle dell'Oro mine

In this mine, by means of a few inclined tunnels, a layer was exploitedthat has been estimated at about 2 million tons of lignite, of which 300,000 tons already individuated.

The lignite concerned, presents slight traces of sulphur, with a humidity of 40 % and a calorific capacity of abt. 2,900 calories.

The only advantage of this mine consisted in the fact that its yard was situated at a very short distance

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of the Terni railway station and that by means of spacial mill-hoppers the lignite could be unloaded directly into the railway waggons. The yard, however, exactly because of its nermess to the railway station of Terni, has suffered by numerous air attacks and consequently all external works have been destroyed.

In the past this mine could give up to 80 tons of lignite per day.

6) - <u>The Gualdo Cattaneo (Basterdo) mine</u>

As already stated this mine belongs to the "Società Termoelettrica Umbra" of which the "Terni" possess half of the actions.

The "Terni", however, exploit this mine directly by means of their own technical mining staff.

The layer of Gualdo Cattaneo has been estimated at about 18,000,000 tons, of which 6,000,000 tons already individuated.

This lignite, as far as the quality is concerned, comes in a second line after same of Spoleto, its humidity amounts to about 40 % and its calorific value to about 2,000 calories.

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nerness to the railway station of Terni, has suffered by numerous air attacks and consequently all external works have been destroyed.

In the past this mine could give up to 80 tons of lignite per day.

6) - The Gualdo Cattaneo (Bastardo) mine

As already stated this mine belongs to the "Società Termoelettrica Umbra" of which the "Terni" possess half of the actions.

The "Terni", however, exploit this mine directly by means of their own technical mining staff.

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This lignite, as far as the quality is concerned, comes in a second line after same of Spoleto, its humidity amounts to about 40 % and its calorific value to about 3,000 calories.

The layer of Gualdo Cattaneo is exploited with five separate yards that extract the lignite by means of inclined galleries.

Important works were being done in order to raise the output and in a particular way :

- construction of three excavation and three ventilation shafts;

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- a system of internal cable-ways for the conveyance to one single forwarding centre of the lignite extracted by the various yards;
- a cable-way of great capacity (abt. 100 tons p.h.) to forward the lignite from the collection centre to the yard of the Spoleto Mines (at a distance of 17 km.) in order to be charged there on the waggons of the State Railways.

The materials necessary for the new mining installations and fot the cable-ways of the Gualdo Cattaneo mine were nearly all ready and the cable-way installation was almost finished.

From this layer it was possibbe, in normal times, to obtain abt. 650 tons of lignite per day.

Connected with the mining plant there was also a thermic plant (run with lignite) for the production of electric power.

This plant consisted in a series of "Mond" gazometers that supplied gaz to three groups consisting in two motors and one alternator each with a total capacity of 15,000 KV.

The excitation current was supplied by a turbine-dy

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The excitation current was supplied by a turbine-dynamo-group that utilized the steam of a special boiler.

This plant, however, has practically never worked because of the high cost of the electric power obtainable by this system.-

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ASPORTATIONS OF MACHINERY AND PRESUMABLE PRESENT PRODUCTION POSSIBILITIES OF THE MINES

ASPORTATIONS

Up to the 4th June no damage had been done to the mines by german occupation and no machinery nor persons had been taken away up to that moment.

Similarly to what had been prearranged for the other works of the company, the managing staff of the company had tried to take all measures apt to delay any asportation and to reduce, as far as possible, all damage caused by the action of pioneers.

POSSIBILITIES OF PRODUCTION

If the german troops do not destroy galleries or machinery, the mines will be in a position to resume in a rather short time their activity.

As, however, the lignite can't remain for a long time deposited on the areas of the mines, the atmospheric agents causing the crumbling and under certain circumstances the autocombustion of the lignite, it is absolutely necessary that the

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As, however, the lignite can't remain for a long time deposited on the areas of the mines, the atmospheric agents causing the crumbling and under certain circumstances the autocombustion of the lignite, it is absolutely necessary that the production activity be resumed in accordance with the reestablishment of the transport possibilities.

Therefore, if the output of the lignite mines of the "Terni" has to be disposed of immediately, it will be necessary to supply the mines with a sufficient number of motor vehicles.-

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Probably it will also be necessary to supply the mines with other materials, oil for motors, for machinery, explosives for gallery work, detonators, etc.

Only later on it will be possible to supply further details on this matter.

REMAINDER OF LIGNITE AT THE MINES

At the moment of the interruption of communications between Rome and Terni there was a residue at the various yards of the mines, including same of Cualdo Cattaneo, of abt. 30,000 tons of lignite, of which, however, only a 60 % will be fit for use owing to the abundant trash that has been formed in the meantime.-

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INFORMATION ON THE CEMENT FACTORY

20th/6/1944

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CEMENT MANUFACTURING PLANT, PLACED IN SANT'ANGELO IN MERCOLE NEAR SPOLETO -

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GENERAL NOTE

This plant, placed in the neighbourhood of the town of Spoleto, was built more than 20 years ago, as soon as possibility was foreseen of using also lignite in the manufacturing of "clinker", although it was a much poorer fuel.

But in reality, lignite employment on an industrial scale has been carried out for the first time in Italy in this plant, and only since very few years, namely since foreign pit coal supplies have ceased.

- Supplied with pit coal, this plant has a 130,000 ton yearly output of artificial cement type 500;
- Supplied instead with lignite, its output falls to 90,000 tons, always of type 500 cement.

The plant can also produce 30,000 tons of hydrated lime.

The output of this plant is only a little part of the total italian out-turn, but it has been sufficient to the needs of the "Terni" 's new plants, and to the request of the

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Ten employees and 260 hands worked in this plant.

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A =) PLANT DATA

Before German occupation this factory was furnished with the following plants, many of which newly built :

- 1) Plant for the manufacturing of cement

a) - An installation for the grinding of the limestone and clay mixture, having a daily output of 264 tons;

b) - an installation for coal desiccation and grinding, having a daily output of 90 tons;

c) - an installation for the manufacturing of "clinker". It is made of two kilns totalling a 285 ton daily output;

d) - an installation for the grinding and diluting of "clinker".

- 2) Plant for the manufacturing of hydrated lime -

a) - 2 lime kilns totalling a capacity of 60 tons;
b) - 1 hydrating apparatus;
c) - 2 silos totalling a capacity of 200 tons;
d) - 1 double sacking machine able to sack 16 tons a day.

- 3) Silos and forwarding

a) - 17 reinforced concrete silos, totalling a capaci-

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- 3) Silos and forwarding

a) - 17 reinforced concrete silos, totalling a capacity of 9,000 tons;

b) - a sacking installation with three automatic sacking machines, having a daily output of 500 tons;

c) - Railway junction - the factory is linked, by its own railway junction, to the national railway system (railway station of Morgnano S.Angelo- Spoleto).-

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B =) SUPPLIES

Electric power, raw and other needing material supply came from the following sources :

1) - Electric power - from the electric plants belonging to our Company, and directly linked to the factory;

2) - Fuels -

a)- lignite - from the Morgnano mines also belonging to our Company;

b)- coke-powder - from the Nera Montoro works, also belonging to our Company;

c)- anthracite - from the "Azienda Carboni Italiana" (Italian Coal Company); lately it came from Northern Silesia (Germany);

3)- Limestone - from a quarry near the factory;

4) - Clay - from a quarry near the factory

5) - Pozzuolana - from a quarry near Gallese (Orte)

6) - Chalkstone - from mines in Northern Italy;

7) - Sacks for finished products - in the beginning, they were supplied by "La Spezia"s Amalgamated Jute-Factories

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7) - Sacks for finished products - in the beginning, they were supplied by "La Spezia"s Amalgamated Jute-Factories" and by the "Terni Jute-Factory"; later on, owing to a complete jute lack, meanly paper-sacks were used, supplied by the "Paper-sacks Producers" Syndicate" - Milan, by the "Emilio De Magistris" Company - Milan - by the "Natrocellulosa" Company - Milan, and by the "A.S.C.A." Company - Rome.

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C =) RECAPITULATORY SCHEDULE OF OUTPUT

AND OF CORRESPONDING ELECTRIC

POWER, RAW AND OTHER MAIN MATERIALS

NEEDED -

A supposed yearly 130,000 ton cement output, and a 30,000 ton hydrated lime output would need a supply of :

- Limestone	180,000	tons
- Clay	52,000	"
- Pozzuolana	39,000	"
- Coke (in pieces)	4,500	"
- Coke-powder	2,500	"
- Pit-coal	17,500	"
- Pyrite-ashes	3,000	"
- Chalk	2,600	"
- Electric power	13,000,000	kWh

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ASPORTATION OF MACHINERY AND PRESUMABLE PRESENT POSSIBILITY OF PRODUCTION OF THE CEMENT FACTORY

ASPORTATIONS

Till June the 4 the German occupation troops had not damaged the cement factory and till then no machinery nor persons employed in the work had been carried away.

Exactly as had been done in the other works of the Company, also here the directors had tried by all means to delay any kind of asportations and to reduce as much as possible the damages caused by the activity of the pioneers.

POSSIBILITIES OF PRODUCTION

If the German troops do not destroy the machinery, the cement factory will immediately be able to resume its activity.

To that purpose, however, it is necessary that the transport of the necessary raw materials be facilitated, namely of pozzuolane, which was supplied by a quarry near Gallese (Orte) and of gypsum stone, of which the work has absolutely no reserves.

Besides it will be necessary to obtain a supply of pit-coal and of coke-powder, even if in modest quantities.

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RESIDUES IN THE WORK -

When the communications between Rome and Terni were interrupted, in the cement factory there existed about 20,000 tons of clinker which could easily be ground and transformed into about 28,000 tons of cement, provided pozzuolane and gypsum stone are at disposal.

There also was a reserve of about 1,500 tons of cemant ready to be forwarded.

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INFORMATION ON THE ELECTRIC PLANTS

20th/6/1944

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Ente M. Bacino

PIANO REGOLATORE
DEI BACINI DEL VOMANO E DEL TORDINO
E DEGLI ALTI BACINI DEL TRONTO E DEL SALINE

SCALA 1. 250 000

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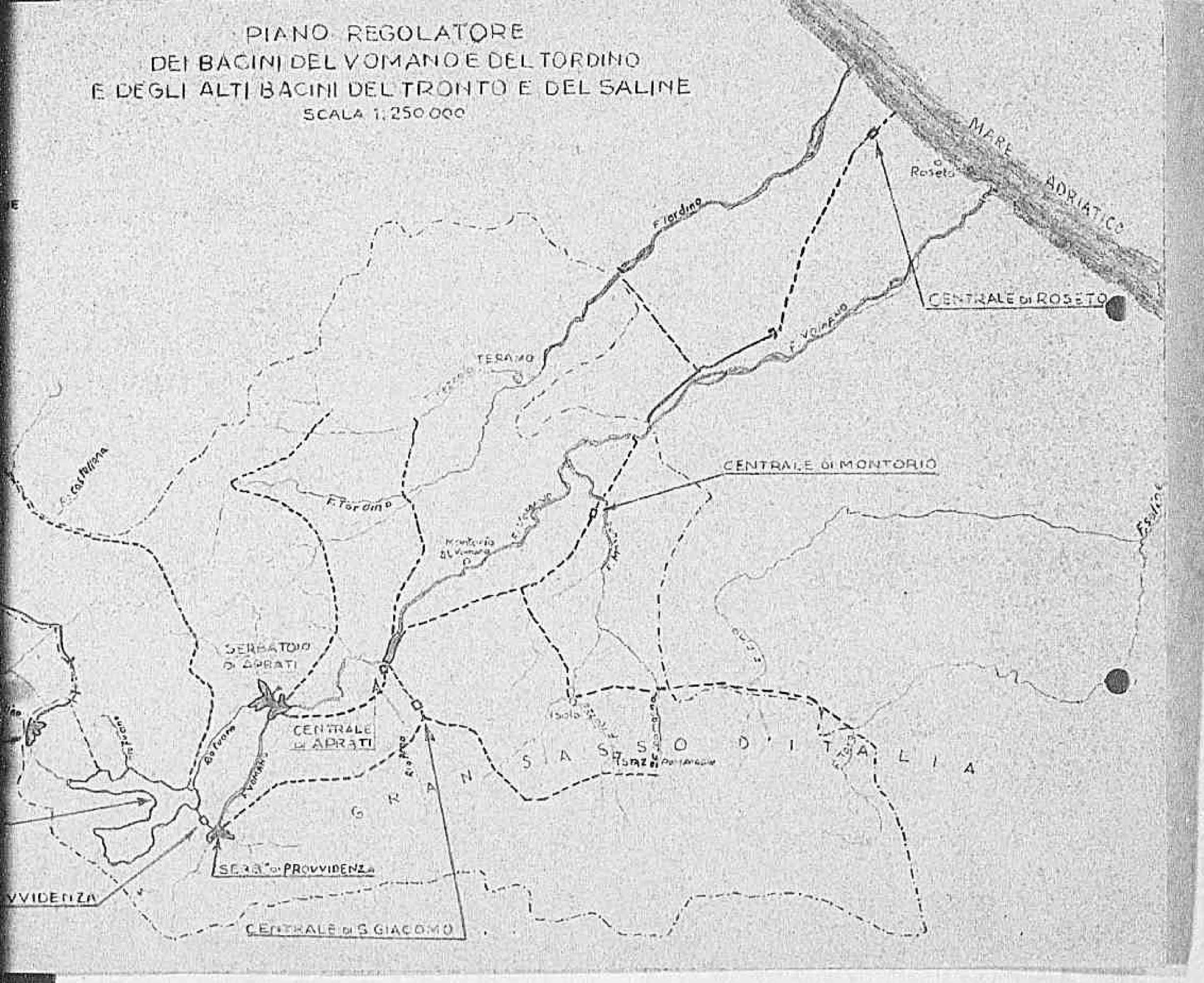
PIANO REGOLATORE
DEI BACINI DEL VOMANO E DEL TORDINO
E DEGLI ALTI BACINI DEL TRONTO E DEL SALINE
SCALA 1:250.000



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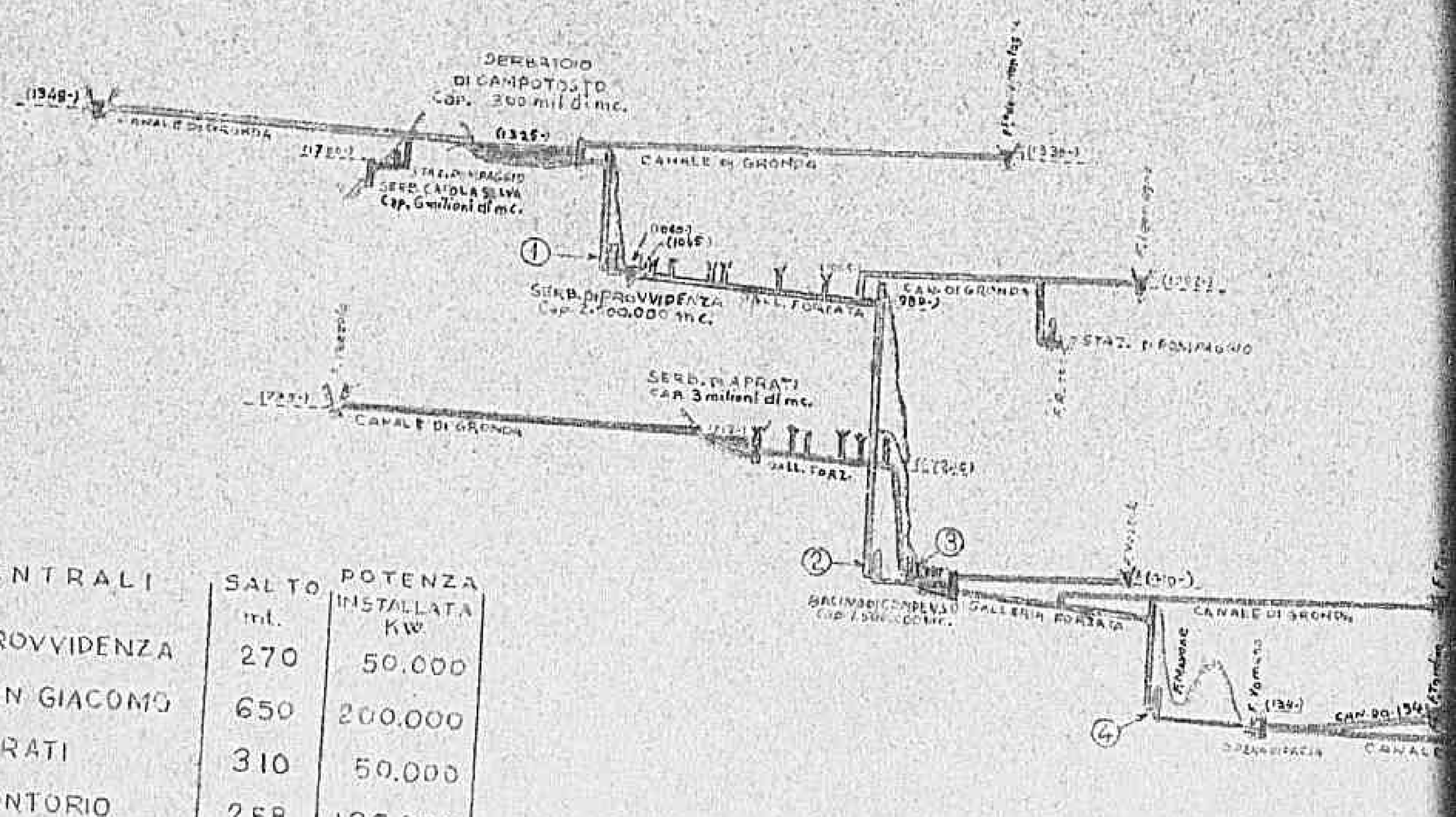
Dis. N. 5944

PROFILO SCHEMATICO DEGL'IMPIANTI SUL FIUME VOMANO



CENTRALI	SALTO mt.	POTENZA INSTALLATA KW.
① PROVVIDENZA	270	50.000
② SAN GIACOMO	650	200.000
③ APRATI	310	50.000
④ MONTORIO	258	120.000
⑤ ROSETO	119	60.000

IMPIANTI IN COSTRUZIONE

IMPIANTI IN PROGETTO

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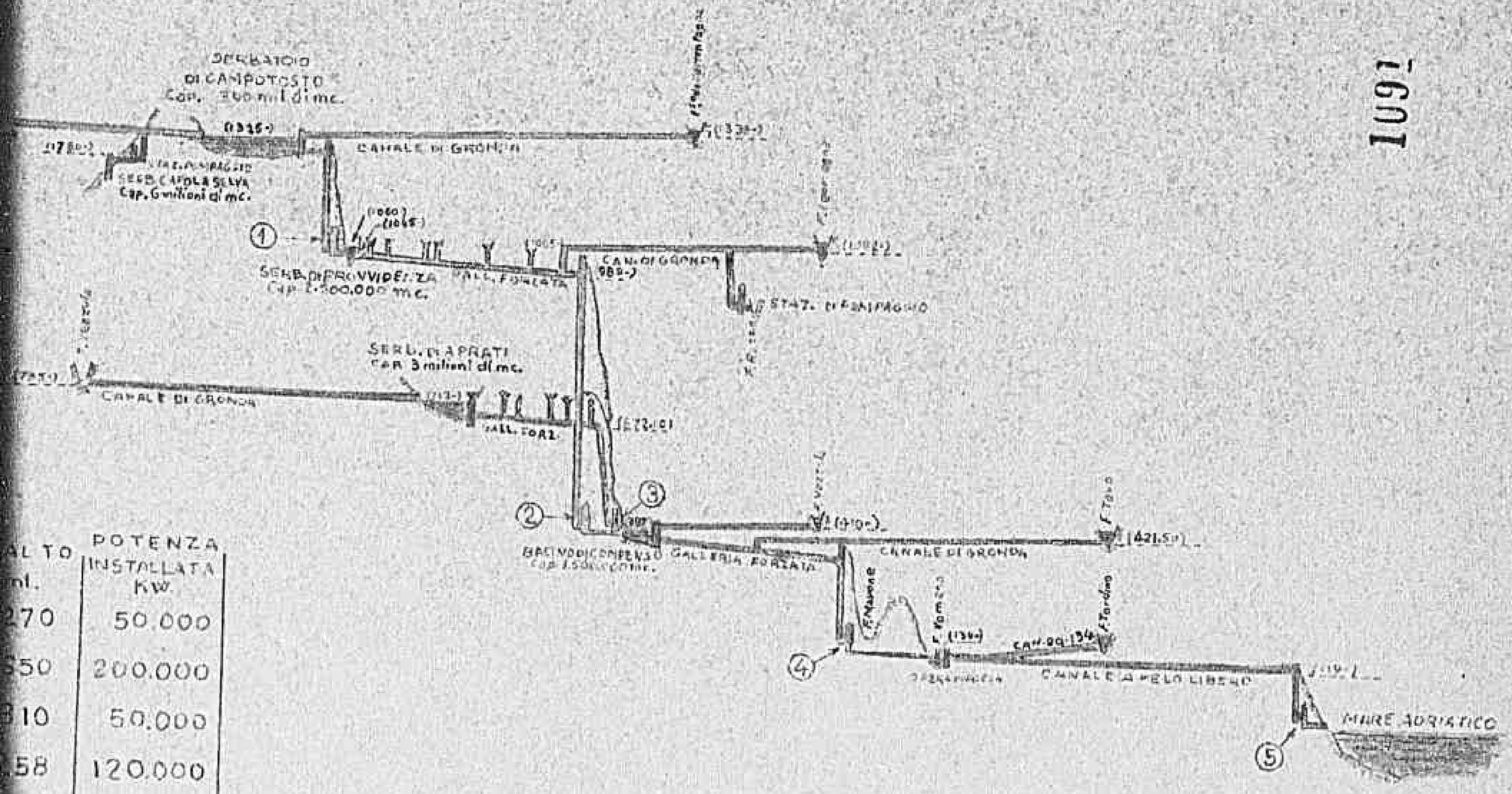
PROFILO SCHEMATICO DEGL'IMPIANTI SUL FIUME VOMANO



SALTO mt.	POTENZA INSTALLATA Kw.
270	50.000
550	200.000
310	50.000
158	120.000
19	60.000

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Cs N° 8945

PIANO REGOLATORE DEI FIUMI NERA E VELINO

Scala 1:500.000

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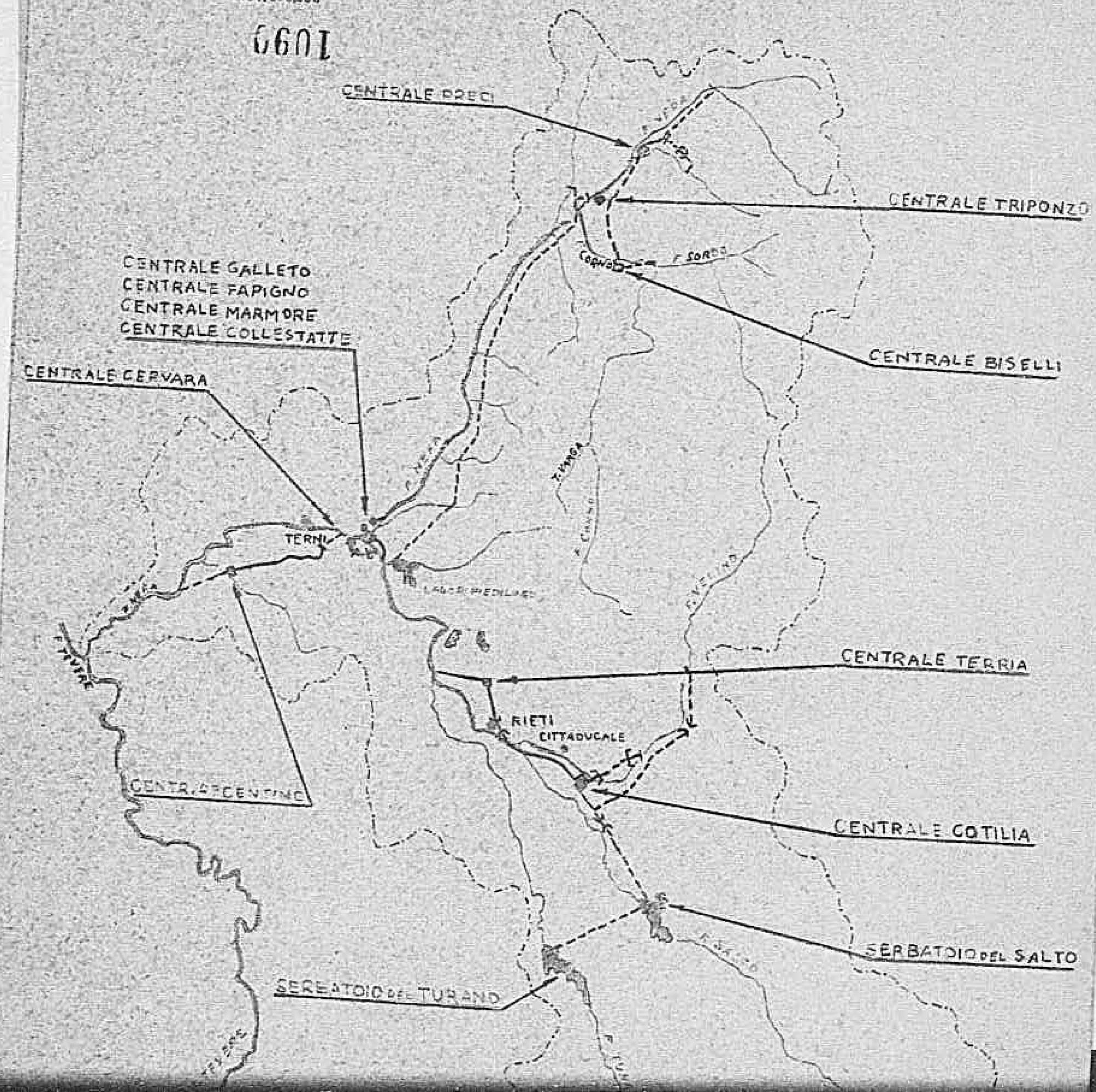
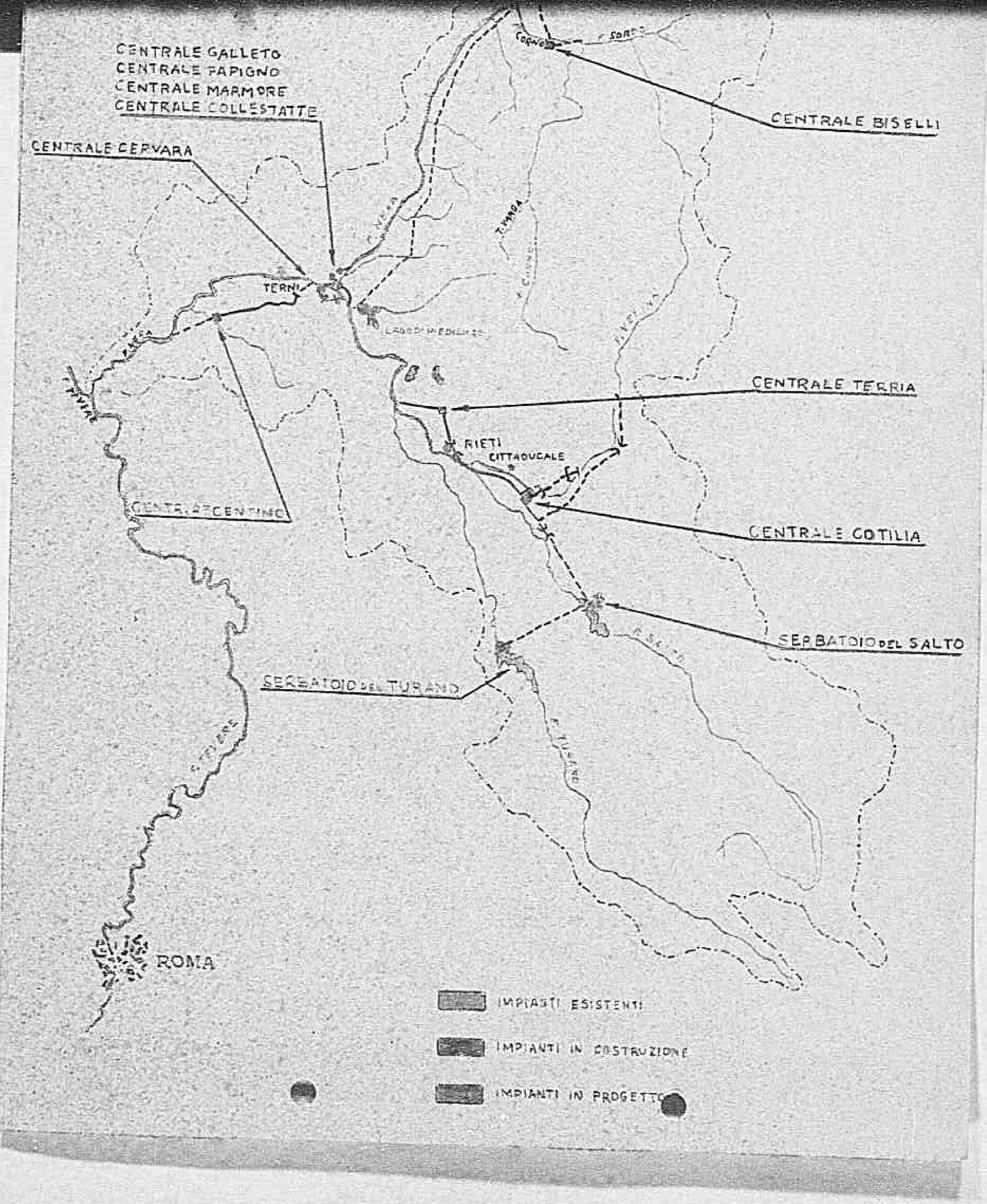


Declassified E.O. 12356 Section 3.3/NND No. 785019



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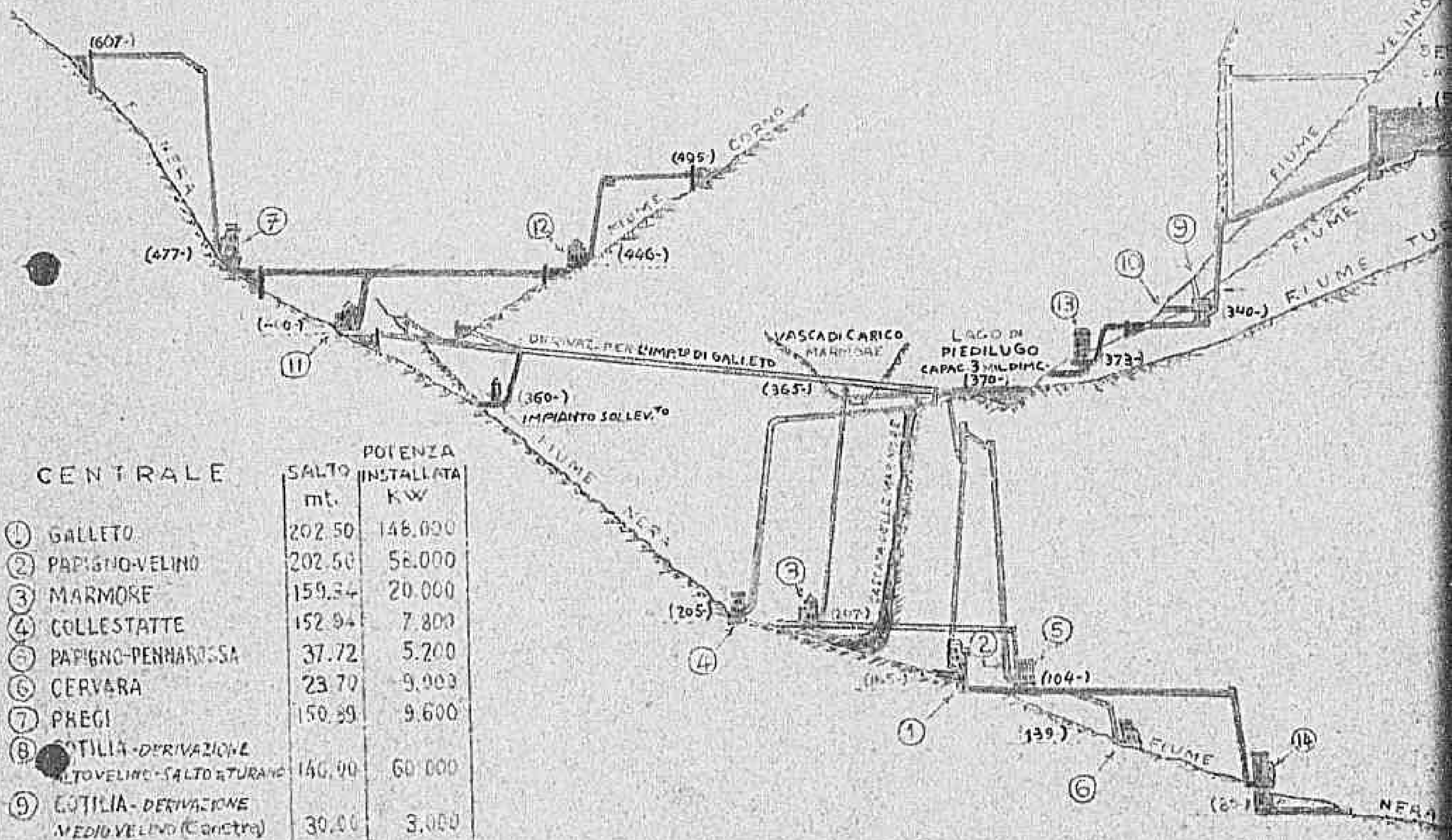
Declassified E.O. 12356 Section 3.3/NND No. 785019

Ds N.69-2

PROFILO SCHEMATICO DEGL'IMPIANTI DEI FIUMI NERA E VELINO



CENTRALE	SALTO mt.	POTENZA INSTALLATA KW
(1) GALLETO	202.50	146.000
(2) PAPIGNO-VELINO	202.50	56.000
(3) MARMORE	159.34	20.000
(4) COLLESTATTE	152.94	7.800
(5) PAPIGNO-PENNAROSSA	37.72	5.200
(6) CERVARA	23.70	9.000
(7) PREGI	150.39	9.600
(8) COTILIA - DERIVAZIONE ALTOVELINO - SALTO TURANO	140.00	60.000
(9) COTILIA - DERIVAZIONE MEDIOVELINO (Canetra)	30.00	3.000
(10) COTILIA DERIVAZIONE PESCHIERA	11.00	3.300
(11) TRIPONZO	40.00	5.500
(12) BISELLI	44.00	3.000
(13) TERRIA	17.00	12.000
(14) RECENTINO	80.00	100.000

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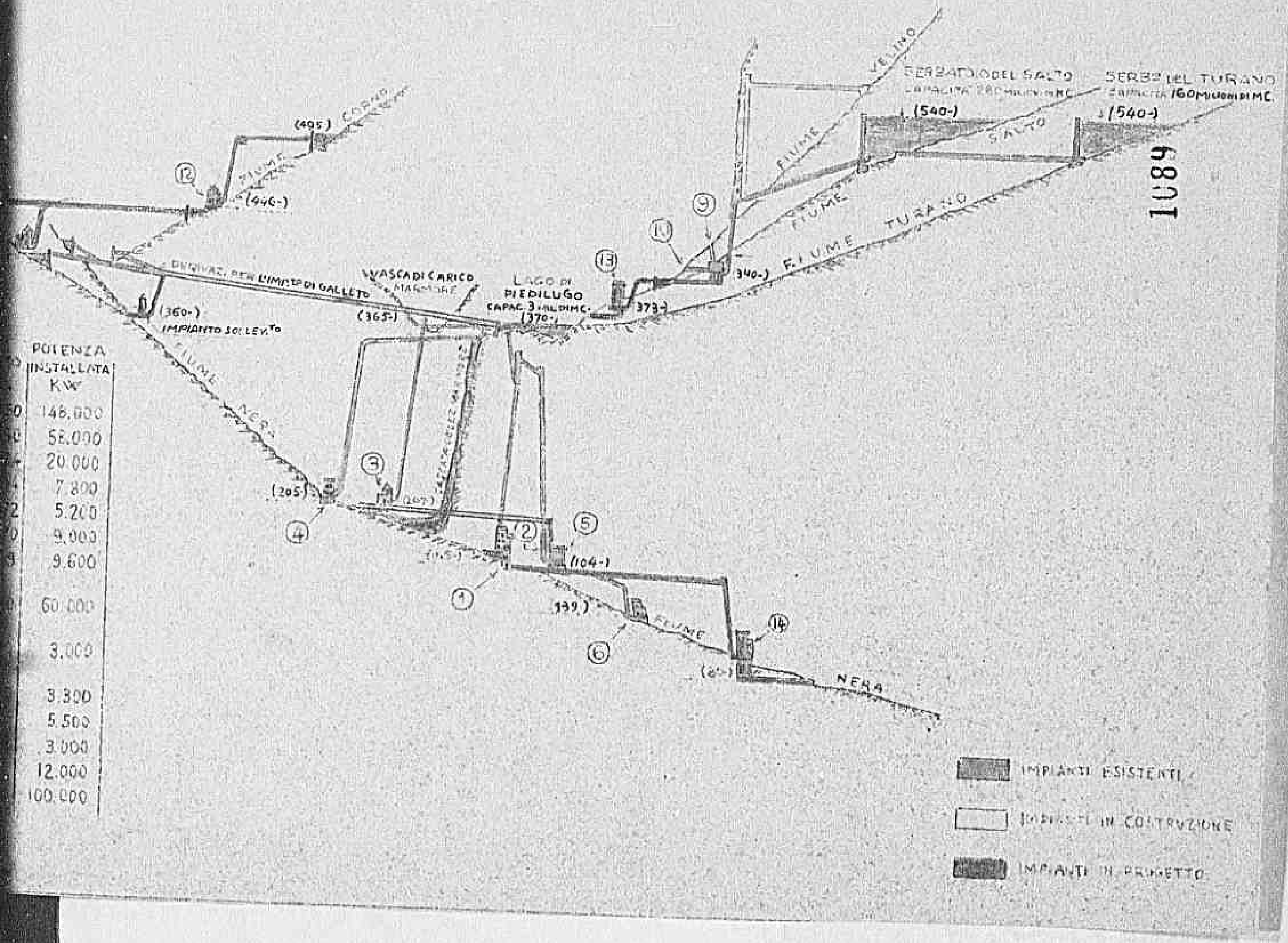
PROFILO SCHEMATICO DEGL'IMPIANTI DEI FIUMI NERA E VELINO



	POTENZA INSTALLATA KW
50	146.000
2	58.000
4	20.000
1	7.800
2	5.200
0	9.000
3	9.600
	60.000
	3.000
	3.300
	5.500
	3.000
	12.000
	100.000

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ELECTRIC PLANTS OF SOCIETA' "TERNI"

The"Società Terni" with the whole of its hydroelectric works already in operation and of its high tension transmission lines is undoubtedly the most important producting group of central Italy.

Moreover it has already begun an extended program of works, some of them are already in advanced progress of construction and their accomplishment will place "Società Terni" among the greatest italian producers of electric energy.

ELECTRIC PLANTS IN OPERATION -

Hydroelectric stations, now in operation are placed in the province of Terni and of Rieti and make use uf hydrographic basin of Nera and Velino river.

The machinery which is settled there represents the total power of 324.000 KVA, and the energy which can the produced into an year of everage precipitations is of about 1,230,000,000 kWh.

To rule within the year this huge quantity of energy two reservoirs has been constructed over the river Turano and Salto with the respective capacity of 160,000,000 and 240,000,000 of cubic meters.

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To rule within the year this huge quantity of energy two reservoirs has been constructed over the river Turano and Salto with the respective capacity of 160,000,000 and 240,000,000 of cubic meters.

They are connected between them by a tunnel pressure 9 km. long, so that they work as a only capacity of 400,000,000

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of c;m.

From the here enclosed plan and schematic outline of plants it is possible to see both the topographic position of the several stations, and their peculiarities as regards fall and installed power.

The most remarkable stations are :

a) - Galleto, where four vertical groups of 43,000 KVA each are installed;

b) - Papigno, where 1 vertical group of 22,000 KVA, 1 horizontal group of 20,000 KVA, and 5 horizontal groups of 3000 KVA are installed;

c) - Cotilia, where 2 horizontal groups of 30,000 KVA each and two vertical groups of 3,000 KVA are installed.

The station of Cotilia has got special peculiarities. It is underground; and while the minor groups make use of the water flowing from the Velino, the greater groups are fed by the joined reservoirs of Salto and Turano as we have explained before.

Moreover each one of the greater groups is composed of a turbine, alternator, and a pump so that they can function either as generator groups utilizing water from reservoirs or as pumping groups lifting up the river Velino water into the reservoirs. With special couplings

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Moreover each one of the greater groups is composed of a turbine, alternator, and a pump so that they can function either as generator groups utilising water from reservoirs or as pumping groups lifting up the river Velino water into the reservoirs. With special couplings it is possible to disjoint from the alternator either the pump or the turbine, and when one wants to pump water inside the reservoirs the turbine is disjointed while the alternator works as synchronous motor.

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The peculiarities of the pump are: flow 14 cm/s maximum prevalence 140 m.

The station of Cotilia has been equipped with this complex machinery to realise a full regulation of hydrographic basins of the rivers Nera and Velino. Moreover in this manner there is the possibility to make use of the exceding power of the "Terni", storing it under form of water up to the reservoirs.

The exhaust of Cotilia plant, together with the water flowing from Velino and Nera feeds the stations of Galleto and Papigno. These two stations have also a proper own basin of daily regulation represented by the lake of Piediluco, of the capacity of about 2,000,000 of c.m.

Part of the energy producted by "Società Terni" goes to feed the plants of the same company which concern the siderurgical and electrochemical industry; part of it is given to some great custumers, the most important of them are :

- 1) "Società Romana di Elettricità" which distributes energy to Rome and Latium;
- 2) "Azienda Elettrica del Governatorato" which distributes energy to Rome and Latium;
- 3) "Società Elettrica del Valdarno" which distributes

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complex machinery to realize a full regulation of hydrographic basins of the rivers Nera and Velino. Moreover in this manner there is the possibility to make use of the exceding power of the "Terni", storing it under form of water up to the reservoirs.

The exhaust of Cotilia plant, together with the water flowing from Velino and Nera feeds the stations of Galleto and Papigno. These two stations have also a proper one basin of daily regulation represented by the lake of Piediluco, of the capacity of about 2,000,000 of c.m.

Part of the energy producted by "Societh Terni" goes to feed the plants of the same company which concern the siderurgical and electrochemical industry; part of it is given to some great customers, the most important of them are :

- 1) "Societh Romana di Elettricith" which distributes energy to Rome and Latium;
- 2) "Azienda Elettrica del Governatorato" which distributes energy to Rome and Latium;
- 3) "Società Elettrica del Valdarno" which distributes energy into Toscany;
- 4) "Unione Esercizi Elettrici" which distributes energy into Umbria and Marche;

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- 5) "Società Meridionale di Elettricità" which distributes energy to Naples and the south of Italy;
- 6) "Ferrovie dello Stato" for the needs of electric traction in the central Italy;
- 7) "Società Elettrica Interamna" , which distributes energy into the zone of Terni.

To forward energy to its custumers "Società Terni" disposes of an important electric work at high tension and precisely :

- one line at 230 KV and one at 150 KV from Terni to Popoli to the use of "Società Meridionale di Elettricità";
- one line at 120 KV from Terni to Camerino to the use of "Società Unione Esercizi Elettrici";
- one line at 120 KV from Terni to Chiusi, and one from Preci to Chiusi to the use of "Società Valdarno" and "Ferrovie dello Stato";

Moreover one line at 120 KV links the station of Preci with that of Gallete and two lines respectively at 70 and 30 KV bring energy from Terni to the plant of Ne-

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Moreover one line at 120 KV links the station of Preci with that of Gallete and two lines respectively at 70 and 30 KV bring energy from Terni to the plant of Nera Montoro.

The building of the two reservoirs of Salto and Turano and of Cotilia-Station with its pumps installation,

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which has been accomplished from 1933 to 1943, has allowed, as we said before, to have all the energy production of the company fully settled.

Therefore it has been possible to organize special agreements with other electric concerns as the "Società Romana", the "Valdarno" and the "Terrovie dello Stato" which are custumers of "Società Terni" energy but have generating plants of their own.

These agreements state that the surplus and not utilized energy produced by the over said plants during raining times, is supposed to be poured over the net work of the "Società Terni" which engages itself to return only a part of it.

For the reason the "Società Terni" plants undertake a regulating function over all the electric plants produced in Central Italy and their importance has very much increased. Therefore our company disposes beyond the energy of its own production, also of an amount of yearly variable energy according to metheorological conditions, and that energy is particulary appointed to its own electrochemical and hydroelectric industries, or even to accumulation by mean of pumps.

The staff occupied at the electric plants works of the "Terni" company is as follows:

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- managers and employees N° 136
- workmen and salaried persons " 774

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PLANTS THAT ARE BEING BUILT

What we have said above concerns only "Società Terni" electric plants working at the moment; but our Company have formerly begun a wide program of hydroelectric works that, unhappily, the present war has at first hampered and then forced to suspend at all.

We will give below some approximate indications of these initiatives :

A) Vomano plants

These important works, when finished, will contain four principal and one smaller station which shall make wholly use of the river Vomano basin.

Two of them, called "Provvidenza" and "San Giacomo" were going to be finished, and works have been begun for the third one, called "Montorio".

The first station, called " Provvidenza" is completely digged into cavern and is directly fed through a short tunnel and a vertical strained well (270 meters high) by the artificial lake of Campotosto, which has the capacity of 145,000,000 cubic meters, placed at 1,300 meters on the sea level.

Three groups of 50,000 KVA, two of them supplied with a pump, are to be settled into the station, with the same above mentioned details about Cotilia Station.

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Three groups of 50,000 KVA, two of them supplied with a pump, are to be settled into the station, with the same above mentioned details about Cotilia Station.

All the hydraulic works of this station are for 70 % ready; one group of the generating machinery is already finished.

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The second station or of "S.Giacomo" is also into cavern and through a compensation basin of 2,500,000 cubic meters shall make use of the exhausted water of "Provvidenza" and of the other water which flow from the massive of Gran Sasso.

Through a strained tunnel, 14 km., long and 40 c.m./1" of flow, the water reach a vertical strained well, 670 meters high, 2,50 meters in diameter, which feeds three generators groups 65,00 KVA each.

The hydraulic works of this second station are ready for the 80 % and the machinery is already built and partly assembled.

The two first stations of "Provvidenza" and "San Giacomo", whose works have very much improved and whose machineries are ready, shall be able to produce 600 millions of fully regulated energy every year.

Also of these "Vomano" plants, which our Company hopes to be able to finish rapidly, we enclose a plan and a schematic sketch.

B) "Recentino" station

This station at the feet of Galleto station must complete the basin utilization of Nera and Velino rivers.

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This station at the feet of Gallete station must complete the basin utilization of Nera and Velino rivers.

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Hydraulic works are represented by a 11 km. long canal which has a flow of 180 c.m./1" and by a 82 meters high strained well which distributes water to 3 vertical groups, 50,000 KVA, each. The station is underground, and it results an exhaust tunnel which is long about 5 Km.

The study of this plant has been completed in every details and even each machinery order has been examined with our supplying firms. Many work building yards have been settled and the exhaust tunnel excavation has begun, which represents the most difficult part of the work.

Recentino station shall be able supply with 400 millions of kWh a year of regulated energy from the actual reservoirs of Salto and Turano.

C) "Sangro" plant

This plant has been begun from our "Società Terni" in collaboration with "Società Meridionale di Elettricità".

It comprehends the building of two reservoirs on the river Sangro at Opi and Barrea with the respective capacity of 28 and 24 millions of cubic meters and of "Villa Santa Maria" station wich makes use of a 415 meters fall, where 3 groups of 45,000 KVA each shall be installed.

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The energy, fully regulated, which can be produced by the station in anaverage year is of 230,000,000 of kWh.

For this station machineries have been ordered and building yards for different hydraulic works have been installed.

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D) Tiber plants

The "Società Terni" is a partner of C.O.F.I.T., trust which has been formed for the hydroelectric working of middle and low Tiber and of Vico and Bracciano lakes. This complex plant, when finished, ought to supply about one milliard of kWh a year.

Definitive projects are been drawn up.

Thermic electric plants

The power produced by the Terni is, in normal times, wholly of hydroelectric origin.

The Company, however possess in jont-property with the Società Anonima Italiana per la Gomma Sintetica (S.A.I.G.S.) a thermo electric power station near Gualdo Cattaneo (Bastardo) in the Province of Perugia.

The power station uses as fuel the lignite extracted from the near mine.

The plant consist in a series of "Mond" gazogens that supply the gas three groups consisting in two motors and one alternator each with a total installed capacity of 15,000 KW.

Said plant, however, has worked only rarely because of the high cost of electric power obtainable by this plant.

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DAMAGES AND ASPORTATIONS SUFFERED BY THE ELECTRIC WORKS AND THEIR IMMEDIATE PRODUCTIVE POSSIBILITIES

We refer to the situation existing to the eve of June 4, 1944, that is to the moment, when the direction of Rome was detached from the Terni Establishments. Therefore we cannot write anything about the destructions that may occur in consequence of the passage of the Front through the Establishments.

Until June 4 damage suffered by the electric plants has been limited.

The dismounting and the requisitions imposed by the Germans did not apply to the large machinery, but only to storage materials, and never were executed in a large scale.

An air-raid which hit the stations of Galleto and Papigno did not produce excessive damage. It has, in fact, been possible to reactivate the station of Galleto, whilst the Papigno station, whose building and high pressure pipe-lines were hit, can probably be again put into efficiency in about a month and a half of work.

On the whole the productive possibilities of the electric plants have substantially remained unchanged and may be

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On the whole the productive possibilities of the electric plants have substantially remained unchanged and may be estimated at about a hundred millions KWh monthly.

Also the electric lines had not suffered any distructions till June 4.

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Afflux to the reservoirs of Salto and Turano rivers was much reduced(it was about 80 millions cubic-meters, whilst their capacity is of 400 million cubic meters), but that was done to protect the works against eventual damages.

One can rely on the coming autumn rains for a water supply sufficient to meet all necessities.-

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FIRST SUMMARY REPORT UPON THE DAMAGES CAUSED TO THE "TERNI" HYDROELECTRIC POWER STATIONS BY THE GERMAN TROOPS DURING THEIR RETREAT -

The germans, before their retreat from the provinces of Terni and Rieti have caused very heavy damages to the hydro-electric power stations of our Company, with the evident aim of paralyzing all the industries of central Italy, destroying their sources of power.

In the investigation executed at Terni on the 17th. and 18th. inst., as soon as it was possible to reach that town, we have been able to ascertain the following details :

1) - Marmore power station: installed capacity 20,000 KVA. It is entirely destroyed. Repairs are not possible. The hydraulic works are not damaged.

2) - Collestatte power station: installed capacity 10,000 KVA; it is entirely destroyed. Repairs are not possible. The hydraulic works are not damaged.

3) - Small reserve power stations in the Municipality of Terni and Spoleto, "Centurini", "Campofregoso", with the total capacity of 8,000 KVA. They are completely destroyed and

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4) - Cervara power station: installed capacity 12,000 KVA, divided in five groups of 2,000 KVA each and two groups of 1,000 KVA each. The damages that we have ascertained are:

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The roof has fallen; all the turbines have had their case broken by explosive charges; the alternators have been damaged by cast splinters.
The hydraulic works have not suffered. It is possible to try to repai some engines. We hope to put again into operation one group of 2,000 KVA within a month and three groups of 2,000 KVA each within two months. We have already begun the works required.

5) - Papigno power station: installed capacity 87,000 KVA, i.e.: one vertical group of 22,000 KVA, one horizontal group of 20,000 KVA, five horizontal groups of 9,000 KVA.
All the groups are heavily damaged both in the hydraulic part and in the electric one. The whole of the roof of the building has fallen. After the first ascertainment, it seems possible to reassemble one of 9,000 KVA, using the uninjured parts of the twin units. We are obliged to remove the ruins for considering the other possibilities; the removing work has already begun. The water pipes have only partly suffered.

6) - Galleto power station: installed capacity 172,000 KVA, divided in four vertical groups. The explosive charges were applied upon the transformers and upon the cover of the turbines.
From our first investigation, only summary owing to the ruins, it seems that the damages in the hydraulic parts

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6) - Galleto power station: installed capacity 172,000 KVA, divided in four vertical groups. The explosive charges were applied upon the transformers and upon the cover of the turbines.

From our first investigation, only summary owing to the ruins, it seems that the damages in the hydraulic parts are limited to the cover of the turbines, to the upper bearing of the same and to the synchronous discharge work.

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Moreover it seems that the mechanical part of the alternators has not suffered, while we have not yet ascertained the conditions of the windings. The exciting dynamos have the windings partly burnt.
The transformers (5 of 43,000 KVA each) are the more damaged; their cases are broken down; the cores and the coils are ruined.
The power station building has on the whole endured the explosions, in spite of the fact that some walls and two pillars have fallen. The cranes are uninjured.
As for the hydraulic part, one of the gates of the movable dam of Piediluco has been damaged, only after the complete removal of the ruins (that has already begun), one will be able to express a more sure judgement.
If the ultimate examination, that will be possible within a week, confirms the first impression, the Galleto power station will be able to return into operation within six-seven months.

7) - Cotilia power station: installed capacity 66,000 KVA. It is near Cittaducale (province of Rieti), i.e. in a zone where we cannot yet go. According to some information we have had, the aforesaid station has been damaged by means of explosion, but we do not know to what extent.

8) - Preci power station; installed capacity 10,000 KVA. It is near Visso, in a zone where it is not yet pos-

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8) - Preci power station; installed capacity 10,000 KVA.
It is near Visso, in a zone where it is not yet possible to go. We have no report about it.

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9) - Villa Valle substation: the germans have demaged by means of rifle-fire the porcelain of the switches. It is possible to put again some of them into working order.

10) - Transmission lines: It does not seem thet they have been damaged. We are inspecting them.

11) - Transformation Substations: the Narni one is uninjured; we have not yet information about those of Chiusi, Foligno, Aquila and Popoli.

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TERNI - SOCIETÀ PER L'INDUSTRIA E L'ELETTRICITÀ

A NEW ASCERTAINMENT ON THE PRESENT STATE OF OUR ELECTRIC PLANTS, AND ON POSSIBILITY OF RESTORING THEM.

Rome, June 25, 1944

A) CERVARA POWER STATION

Work has been well started and is being vigorously carried out.

Instead of patching the turbines' broken parts, as it seemed possible in a first moment, a stronger work is being carried out: the damaged part is being cut away and replaced with the corresponding part of another machine.

Within the month of July a first 2,000 Kw machine will be in operation, and within Aug. 15 a second unit, having the same power.

The other three machines will have to be melted and worked; we will probably succeed in having them ready for the end of September.

B) CALLETO POWER STATION

After removal of ruins, the first group has become

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it seemed possible in a first moment, a stronger work is being carried out: the damaged part is being cut away and replaced with the corresponding part of another machine.

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B) GALLETO POWER STATION

After removal of ruins, the first group has become accessible, and inspection has confirmed what was said in the report of June 19.

As a matter of fact, the winding has not been damaged. Therefore, as to hydraulic works, the following parts must have to be rebuilt: The turbine's cover with the upper supp0f72

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part of the pre-distributing unit with its control, and the synchronous discharge.

Our Steelworks are able to fuse and work these parts, and are being equipped for this purpose.

The alternator has not been damaged by the oil fire. The winding of nine of the stator's sticks, and of two or three of the rotor's poles must be remade.

The shaft doesn't seem to have losed its shape, however a strict test is being prepared on the spot.

We can repeat what we have already said, that this group will be able to go in operation within six or seven months, that is within January 1945.

As to the other three groups, they are still being cleaned up from the ruins, and therefore nothing sure can yet be said, although one can hope good news also from them, the mines having been symmetrically set.

The transformers are the most damaged, and their restoring is troubling. The coffers will probably be remade by our Steelworks. The nuclei have been exposed to heat for

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parts, and are being equipped for this purpose.

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The transformers are the most damaged, and their restoring is troubling. The coffers will probably be remade by our Steelworks. The nuclei have been exposed to heat for a long time, and therefore their magnetic properties will have to be controlled. Three of them, however, have not suffered from fire, and they will be set in order as soon as unpacked.

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The roasting of all the copper is the worst damage, and we are therefore reckoning on the Naples Wiredrawing Plants, to have the coil wire manufactured. Moreover, there won't be any insulating material, and therefore we are carrying out inquiries with many firms.

Besides this, to put in operation Galleto station's first group when repaired, we have other opportunities, that is to say:

1) One of Cotilia station's transformers, that at first sight doesn't seem heavily damaged: ratio 10 - 120 - 150 KV, power 38,000 KVA.

2) One transformer from Nera Montoro, that must only have the straps changed: ratio 60 - 70 KV, power 18,000 KVA.

3) Two transformers offered to us by the "AGEA", ratio 8,5/60/150 KV, power 20,000 KVA each.

We will therefore be able to distribute power from Galleto's first two groups, without waiting for Galleto's transformers to be repaired.

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We have committed to the firm "Zaccheo" the repairing of the buildings at Galleto and Cervara.

We have agreed with the "Brown-Boveri" and the "Mater", so that these firms will help us to repair the purely electric parts.

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HEADQUARTERS
ALLIED CONTROL COMMISSION
Public Works and Utilities Sub-Commission
APO 394

ELECTRIC GENERATION AND CONSUMPTION
TERNI AREA

GENERATION
(Measured at the Generating Stations)

	Peak KW	Average daily output KWh
Cervara	6,000	116,000
Nera Montoro 50 cycle	8,400	121,000
Steel Works		
Connected to Network	1,450	32,500
Not connected to Network	700	8,950
Total energy generated		278,450

CONSUMPTION
(Measured at Distribution Points except for Florence which is measured at Nera Montoro)

	Peak KW	Average daily consumption KWh
Florence (To Valdarno Company)	9,000	117,000
Terni Plants		
Auxiliary Services	80	1,800
Nera Montoro (Ammonia Plant)	600	12,500
Papigno (Carbide Plant)	700	12,200
Spoleto (Cement Mill & Mines)	1,000	15,300
Steel Works	1,800	25,000
Terni - Interamna	1,600	25,300
Narni City	300	4,800
	50	2,250

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Nera Montoro 50 cycle	8,400	121,000
Steel Works		
Connected to Network	1,450	32,500
Not connected to Network	700	8,950
Total energy generated.....		278,450

CONSUMPTION

(Measured at Distribution Points except for Florence which is measured at Nera Montoro)

	Peak KW	Average daily consumption KWh
Florence (To Valdarno Company)	9,000	117,000
Terni Plants		
Auxiliary Services	80	1,800
Nera Montoro (Ammonia Plant)	600	12,500
Papigno (Carbide Plant).	700	12,200
Spoleto (Cement Mill & Mines). . . .	1,000	15,300
Steel Works.	1,800	23,000
Terni - Interamna	1,600	23,300
Narni City.	300	4,800
Carbon Plant (Electric Furnace). . .	50	2,450
UNES		
Nera Montoro	800	15,500
Rieti.	800	15,300
Spoleto.	1,800	26,700
Cisa Viscosa (Textiles)	40	810
SIRI (Hydrogen Plant)	600	1,750
Total energy consumption		274,210

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ELECTRIC GENERATION AND CONSUMPTION
ROME AREA

SOURCES

	Average Contribution to Rome Peak KW	Average daily Supply to Rome KWhr
Steam Plants		
A.C.E.A.	7,600	119,000
S.R.E.	8,550	149,000
Hydro Plants	10,350	265,000

APPROXIMATE AVERAGE CONTRIBUTION OF HYDRO PLANTS TO ROME

	Average Contribution to Rome Peak KW	Average daily Supply to Rome KWhr
Nera Montoro	4,000	115,000
Tivoli Group		
Arci	1,190	20,500
Comunacqua	1,470	36,100
Scalelle	1,500	29,100
Subiaco.	1,430	38,500
Vesta.	1,050	25,800

CONSUMPTION - ROME CITY

	Average Peak KW	Average daily Consumption

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	Average Contribution to Rome Peak KW	Average daily Supply to Rome KWhr
Steam Plants		
A.C.E.A.	7,600	119,000
S.R.E.	8,550	149,000
Hydro Plants	10,350	265,000

APPROXIMATE AVERAGE CONTRIBUTION OF HYDRO PLANTS TO ROME

	Average Contribution to Rome Peak KW	Average daily Supply to Rome KWhr
Nera Montoro	4,000	115,000
Tivoli Group		
Arci	1,190	20,500
Comunacqua	1,470	36,100
Scalelle	1,500	29,100
Subiaco.	1,430	38,500
Vesta.	1,050	25,800

CONSUMPTION - ROME CITY

	Average Peak KW	Average daily Consumption KWhr
Rome	26,500	533,000

CONSUMPTION - ROME OUTSKIRTS

	Average Peak KW	Average daily Consumption KWhr
Rome North Railway	350	3,200
Rome Province	-	15,400
Subiaco Area	2,500	29,000
Tivoli Area	1,400	12,400

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ELECTRIC GENERATION AND CONSUMPTION
TERNI AREA

GENERATION
(Measured at the Generating Stations)

	Peak KW	Average daily output KWh
Cervara	6,000	116,000
Nera Montoro 50 cycle	8,400	121,000
Steel Works		
Connected to Network	1,450	32,500
Not connected to Network	700	8,950
Total energy generated		278,450

CONSUMPTION
(Measured at Distribution Points except for Florence which is measured at Nera Montoro)

	Peak KW	Average daily consumption KWh
Florence (No Valdarno Company)	9,000	117,000
Terni Plants		
Auxiliary Services	80	1,800
Nera Montoro (Ammonia Plant)	600	12,500
Papigno (Carbide Plant)	700	12,200
Spoleto (Cement Mill & Mines)	1,000	15,300
Steel Works	1,800	23,000
Terni - Interamna	1,600	25,300
Narni City	300	4,800
	50	2,250

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Nera Montoro 50 cycle	8,400	121,000
Steel Works		
Connected to Network	1,450	32,500
Not connected to Network	700	8,950
Total energy generated.....		278,450

CONSUMPTION
(Measured at Distribution Points except for Florence which is measured at Nera Montoro)

	Peak KW	Average daily consumption KWh
Florence (To Valdarno Company)	9,000	117,000
Terni Plants		
Auxiliary Services	80	1,800
Nera Montoro (Ammonia Plant)	600	12,500
Papigno (Carbide Plant).	700	12,200
Spoleto (Cement Mill & Mines). . . .	1,000	15,300
Steel Works.	1,800	23,000
Terni - Interamna	1,600	23,300
Narni City.	300	4,800
Carbon Plant (Electric Furnace). . .	50	2,250
UNES		
Nera Montoro	800	15,500
Rieti.	800	15,300
Spoleto.	1,800	26,700
Cisa Viscosa (Textiles)	40	810
SIRI (Hydrogen Plant)	600	1,750
Total energy consumption		274,210

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ROME AREA

SOURCES

	Average Contribution to Rome Peak KW	Average daily Supply to Rome KWhr
Steam Plants		
A.C.E.A.	7,600	119,000
S.R.E.	8,550	149,000
Hydro Plants	10,350	265,000

APPROXIMATE AVERAGE CONTRIBUTION OF HYDRO PLANTS TO ROME

	Average Contribution to Rome Peak KW	Average daily Supply to Rome KWhr
Nera Montoro	4,000	115,000
Tivoli Group		
Arci	1,190	20,500
Comunacqua	1,470	36,100
Scalelle	1,500	29,100
Subiaco.	1,430	38,500
Vesta.	1,050	25,800

CONSUMPTION - ROME CITY

	Average Peak KW	Average daily Consumption KWhr
Rome	26,500	533,000

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	Average Contribution to Rome Peak KW	Average daily Supply to Rome KWhr
Steam Plants		
A.C.E.A.	7,600	119,000
S.R.E.	8,550	149,000
Hydro Plants	10,350	265,000

APPROXIMATE AVERAGE CONTRIBUTION OF HYDRO PLANTS TO ROME

	Average Contribution to Rome Peak KW	Average daily Supply to Rome KWhr
Nera Montoro	4,000	115,000
Tivoli Group		
Arci	1,190	20,500
Comunacqua	1,470	36,100
Scalelle	1,500	29,100
Subiaco	1,430	38,500
Vesta	1,050	25,800

CONSUMPTION - ROME CITY

	Average Peak KW	Average daily Consumption KWhr
Rome	26,500	535,000

CONSUMPTION - ROME OUTSKIRTS

	Average Peak KW	Average daily Consumption KWhr
Rome North Railway	350	3,200
Rome Province	-	15,400
Subiaco Area	2,500	29,000
Tivoli Area	1,400	12,400

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TERNI AREA

GENERATION
(Measured at the Generating Stations)

	Peak KW	Average daily output KWh
Cervara	6,000	116,000
Nera Montoro 50 cycle	8,400	121,000
Steel Works		
Connected to Network	1,450	32,500
Not connected to Network	700	8,950
Total energy generated.....		278,450

CONSUMPTION
(Measured at Distribution Points except for Florence which is measured at Nera Montoro)

	Peak KW	Average daily consumption KWh
Florence (To Valdarno Company)	9,000	117,000
Terni Plants		
Auxiliary Services	80	1,800
Nera Montoro (Ammonia Plant)	600	12,500
Papigno (Carbide Plant).	700	12,200
Spoleto (Cement Mill & Mines). . . .	1,000	15,300
Steel Works.	1,800	25,000
Terni - Interamna	1,600	25,300
Narni City.	300	4,800
Carbon Plant (Electric Furnace) . . .	50	2,250

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	Peak KW	Average daily output KWh
Corbara	6,000	116,000
Nera Montoro 50 cycle	8,400	121,000
Steel Works		
Connected to Network	1,450	32,500
Not connected to Network	700	8,950
Total energy generated		278,450

CONSUMPTION
(Measured at Distribution Points except for Florence which is measured at Nera Montoro)

	Peak KW	Average daily consumption KWh
Florence (To Valdarno Company)	9,000	117,000
Terni Plants		
Auxiliary Services	80	1,800
Nera Montoro (Ammonia Plant)	600	12,500
Papigno (Carbide Plant)	700	12,200
Spoleto (Cement Mill & Mines)	1,000	15,300
Steel Works	1,800	25,000
Terni - Interamna	1,600	25,300
Narni City	300	4,800
Carbon Plant (Electric Furnace)	50	2,250
UNES		
Nera Montoro	800	15,500
Rieti	800	15,300
Spoleto	1,800	26,700
Cisa Viscosa (Textiles)	40	810
SIRI (Hydrogen Plant)	600	1,750
Total energy consumption		274,210

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ELECTRIC GENERATION AND CONSUMPTION
ROME AREA

SOURCES

	Average Contribution to Rome Peak KW	Average daily Supply to Rome KWhr
Steam Plants		
A.C.E.A.	7,600	119,000
S.R.E.	8,550	149,000
Hydro Plants	10,350	265,000

APPROXIMATE AVERAGE CONTRIBUTION OF HYDRO PLANTS TO ROME

	Average Contribution to Rome Peak KW	Average daily Supply to Rome KWhr
Nera Montoro	4,000	115,000
Tivoli Group		
Arci	1,190	20,500
Comunecqua	1,470	36,100
Scalelle	1,500	29,100
Subiaco.	1,430	38,500
Vesta.	1,050	25,800

CONSUMPTION - ROME CITY

	Average Peak KW	Average daily Consumption KWhr
Rome	26,500	533,000

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ROME AREA

SOURCES

	Average Contribution to Rome Peak KW	Average daily Supply to Rome KWhr
Steam Plants		
A.C.E.A.	7,600	119,000
S.R.E.	8,550	149,000
Hydro Plants	10,350	265,000

APPROXIMATE AVERAGE CONTRIBUTION OF HYDRO PLANTS TO ROME

	Average Contribution to Rome Peak KW	Average daily Supply to Rome KWhr
Nera Montoro	4,000	115,000
Tivoli Group		
Arci	1,190	20,500
Comunacqua	1,470	36,100
Scalello	1,500	29,100
Subiaco.	1,430	38,500
Vesta.	1,050	25,800

CONSUMPTION - ROME CITY

	Average Peak KW	Average daily Consumption KWhr
Rome	26,500	533,000

CONSUMPTION - ROME OUTSKIRTS

	Average Peak KW	Average daily Consumption KWhr
Rome North Railway	350	3,200
Rome Province	-	15,400
Subiaco Area	2,500	29,000
Tivoli Area	1,400	12,400

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TERNI AREA

GENERATION
(Measured at the Generating Stations)

	Peak KW	Average daily output KWh
Cervara	6,000	116,000
Nera Montoro 50 cycle	8,400	121,000
Steel Works		
Connected to Network	1,450	32,500
Not connected to Network	700	8,950
Total energy generated		278,450

CONSUMPTION
(Measured at Distribution Points except for Florence which is measured at Nera Montoro)

	Peak KW	Average daily consumption KWh
Florence (To Valdarno Company)	9,000	117,000
Terni Plants		
Auxiliary Services	80	1,800
Nera Montoro (Ammonia Plant)	600	12,500
Papigno (Carbide Plant)	700	12,200
Spoleto (Cement Mill & Mines)	1,000	15,300
Steel Works	1,800	23,000
Terni - Interamna	1,600	25,300
		4,800

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(Measured at the Generating Stations)

	Peak KW	Average daily output KWh
Cervara	6,000	116,000
Nera Montoro 50 cycle	8,400	121,000
Steel Works		
Connected to Network	1,450	32,500
Not connected to Network	700	8,950
Total energy generated		278,450

CONSUMPTION

(Measured at Distribution Points except for Florence which is measured at Nera Montoro)

	Peak KW	Average daily consumption KWh
Florence (To Valdarno Company)	9,000	117,000
Terni Plants		
Auxiliary Services	80	1,800
Nera Montoro (Ammonia Plant)	600	12,500
Papigno (Carbide Plant)	700	12,200
Spoleto (Cement Mill & Mines)	1,000	15,300
Steel Works	1,800	25,000
Terni - Interamna	1,600	25,300
Narni City	300	4,800
Carbon Plant (Electric Furnace)	50	2,250
UNES		
Nera Montoro	800	15,500
Rieti	800	15,300
Spoleto	1,800	26,700
Cisa Viscosa (Textiles)	40	810
SIRI (Hydrogen Plant)	600	1,750
Total energy consumption		274,210

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ELECTRIC GENERATION AND CONSUMPTION
ROME AREA

SOURCES

	Average Contribution to Rome Peak KW	Average daily Supply to Rome KWhr
Steam Plants		
A.C.E.A.	7,600	119,000
S.R.E.	8,550	149,000
Hydro Plants	10,350	265,000

APPROXIMATE AVERAGE CONTRIBUTION OF HYDRO PLANTS TO ROME

	Average Contribution to Rome Peak KW	Average daily Supply to Rome KWhr
Nera Montoro	4,000	115,000
Tivoli Group		
Arci	1,190	20,500
Comunacqua	1,470	36,100
Scalelle	1,500	29,100
Subiaco.	1,430	38,500
Vesta.	1,050	25,800

CONSUMPTION - ROME CITY

	Average Peak KW	Average daily Consumption KWhr

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SOURCES

	Average Contribution to Rome Peak KW	Average daily Supply to Rome KWhr
Steam Plants		
A.C.E.A.	7,600	119,000
S.R.E.	8,550	149,000
Hydro Plants	10,350	265,000

APPROXIMATE AVERAGE CONTRIBUTION OF HYDRO PLANTS TO ROME

	Average Contribution to Rome Peak KW	Average daily Supply to Rome KWhr
Nera Montoro	4,000	115,000
Tivoli Group		
Arci	1,190	20,500
Comunacqua	1,470	36,100
Scalelle	1,500	29,100
Subiaco.	1,430	38,500
Vesta.	1,050	25,800

CONSUMPTION - ROME CITY

	Average Peak KW	Average daily Consumption KWhr
Rome	26,500	533,000

CONSUMPTION - ROME OUTSKIRTS

	Average Peak KW	Average daily Consumption KWhr
Rome North Railway	350	3,200
Rome Province	-	15,400
Subiaco Area	2,500	29,000
Tivoli Area	1,400	12,400

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TERNI AREA

GENERATION
(Measured at the Generating Stations)

	Peak KW	Average daily output KWh
Cervara	6,000	116,000
Nera Montoro 50 cycle	8,400	121,000
Steel Works		
Connected to Network	1,450	32,500
Not connected to Network	700	8,950
Total energy generated		278,450

CONSUMPTION
(Measured at Distribution Points except for Florence which is measured at Nera Montoro)

	Peak KW	Average daily consumption KWh
Florence (To Valdarno Company)	9,000	117,000
Terni Plants		
Auxiliary Services	80	1,800
Nera Montoro (Ammonia Plant)	600	12,500
Papigno (Carbide Plant)	700	12,200
Spoleto (Cement Mill & Mines)	1,000	15,300
Steel Works		

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	Peak KW	Average daily output KWh
Cervara	6,000	116,000
Nera Montoro 50 cycle	8,400	121,000
Steel Works		
Connected to Network	1,450	32,500
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Total energy generated		278,450

CONSUMPTION

(Measured at Distribution Points except for Florence which is measured at Nera Montoro)

	Peak KW	Average daily consumption KWh
Florence (To Valdarno Company)	9,000	117,000
Terni Plants		
Auxiliary Services	80	1,800
Nera Montoro (Ammonia Plant)	600	12,500
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Spoleto (Cement Mill & Mines)	1,000	15,300
Steel Works	1,800	23,000
Terni - Interamna	1,600	25,300
Narni City	300	4,800
Carbon Plant (Electric Furnace)	50	2,250
UNES		
Nera Montoro	800	15,500
Rieti	800	15,300
Spoleto	1,800	26,700
Cisa Viscosa (Textiles)	40	810
SIRI (Hydrogen Plant)	600	1,750
Total energy consumption		274,210

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ROME AREA

SOURCES

	Average Contribution to Rome Peak KW	Average daily Supply to Rome KWhr
Steam Plants		
A.C.E.A.	7,600	119,000
S.R.E.	8,550	149,000
Hydro Plants	10,350	265,000

APPROXIMATE AVERAGE CONTRIBUTION OF HYDRO PLANTS TO ROME

	Average Contribution to Rome Peak KW	Average daily Supply to Rome KWhr
Nera Montoro	4,000	115,000
Tivoli Group		
Arci	1,190	20,500
Comunacqua	1,470	36,100
Scalelle	1,500	29,100
Subiaco	1,430	38,500
Vesta	1,050	25,800

CONSUMPTION - ROME CITY

	Average Peak KW	Average daily Consumption KWhr

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	Average Contribution to Rome Peak KW	Average daily Supply to Rome KWhr
Steam Plants		
A.C.E.A.	7,600	119,000
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APPROXIMATE AVERAGE CONTRIBUTION OF HYDRO PLANTS TO ROME

	Average Contribution to Rome Peak KW	Average daily Supply to Rome KWhr
Nera Montoro	4,000	115,000
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Scalelle	1,500	29,100
Subiaco	1,430	38,500
Vesta	1,050	25,800

CONSUMPTION - ROME CITY

	Average Peak KW	Average daily Consumption KWhr
Rome	26,500	535,000

CONSUMPTION - ROME OUTSKIRTS

	Average Peak KW	Average daily Consumption KWhr
Rome North Railway	350	3,200
Rome Province	-	15,400
Subiaco Area	2,500	29,000
Tivoli Area	1,400	12,400

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TERNI AREA

GENERATION
(Measured at the Generating Stations)

	Peak KW	Average daily output KWh
Cervara	6,000	116,000
Nera Montoro 50 cycle	8,400	121,000
Steel Works		
Connected to Network	1,450	32,500
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Total energy generated.....		278,450

CONSUMPTION
(Measured at Distribution Points except for Florence which is measured at Nera Montoro)

	Peak KW	Average daily consumption KWh
Florence (To Valdarno Company)	9,000	117,000
Terni Plants		
Auxiliary Services	80	1,800
Nera Montoro (Ammonia Plant)	600	12,500
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Spoleto (Cement Mill & Mines)	1,000	15,300
Steel Works	1,800	23,000
Terni - Interamna	1,600	25,300
Narni City	300	4,800
Carbon Plant (Electric Furnace)	50	2,250

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Cervara	8,000	121,000
Nera Montoro 50 cycle	8,400	
Steel Works		32,500
Connected to Network	1,450	8,950
Not connected to Network	700	
Total energy generated		278,450

CONSUMPTION

(Measured at Distribution Points except for Florence which is measured at Nera Montoro)

	Peak KW	Average daily consumption KWh
Florence (To Valdarno Company)	9,000	117,000
Terni Plants		
Auxiliary Services	80	1,800
Nera Montoro (Ammonia Plant)	600	12,500
Papigno (Carbide Plant)	700	12,200
Spoleto (Cement Mill & Mines)	1,000	15,500
Steel Works	1,800	25,000
Terni - Interamna	1,600	25,300
Narni City	300	4,800
Carbon Plant (Electric Furnace)	50	2,250
UNES		
Nera Montoro	800	15,500
Rieti	800	15,500
Spoleto	1,800	26,700
Cisa Viscosa (Textiles)	40	810
SIRI (Hydrogen Plant)	600	1,750
Total energy consumption		274,210

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ROME AREA

SOURCES

	Average Contribution to Rome Peak KW	Average daily Supply to Rome KWhr
Steam Plants		
A.C.E.A.	7,600	119,000
S.R.E.	8,550	149,000
Hydro Plants	10,350	265,000

APPROXIMATE AVERAGE CONTRIBUTION OF HYDRO PLANTS TO ROME

	Average Contribution to Rome Peak KW	Average daily Supply to Rome KWhr
Nera Montoro	4,000	115,000
Tivoli Group		
Arci	1,190	20,500
Comunacqua	1,470	36,100
Scalelle	1,500	29,100
Subiaco.	1,430	38,500
Vesta.	1,050	25,800

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	Average Contribution to Rome Peak KW	Average daily Supply to Rome KWhr
Steam Plants		
A.C.E.A.	7,600	119,000
S.R.E.	8,550	149,000
Hydro Plants	10,350	265,000

APPROXIMATE AVERAGE CONTRIBUTION OF HYDRO PLANTS TO ROME

	Average Contribution to Rome Peak KW	Average daily Supply to Rome KWhr
Nera Montoro	4,000	115,000
Tivoli Group		
Arci	1,190	20,500
Comunegua	1,470	36,100
Scalello	1,500	29,100
Subiaco.	1,430	38,500
Vesta.	1,050	25,800

CONSUMPTION - ROME CITY

	Average Peak KW	Average daily Consumption KWhr
Rome	26,500	533,000

CONSUMPTION -- ROME OUTSKIRTS

	Average Peak KW	Average daily Consumption KWhr
Rome North Railway	350	3,200
Rome Province	-	15,400
Subiaco Area	2,500	29,000
Tivoli Area	1,400	12,400

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ELECTRIC GENERATION AND CONSUMPTION
TERNI AREA

GENERATION
(Measured at the Generating Stations)

	Peak KW	Average daily output KWh
Cervara	6,000	116,000
Nera Montoro 50 cycle	8,400	121,000
Steel Works		
Connected to Network	1,450	32,500
Not connected to Network	700	8,950
Total energy generated		278,450

CONSUMPTION
(Measured at Distribution Points except for Florence which is measured at Nera Montoro)

	Peak KW	Average daily consumption KWh
Florence (To Valdarno Company)	9,000	117,000
Terni Plants		
Auxiliary Services	80	1,300
Nera Montoro (Ammonia Plant)	600	12,500
Papigno (Carbide Plant)	700	12,200
Spoleto (Cement Mill & Mines)	1,000	15,300
Steel Works	1,800	25,000
Terni - Interamna	1,600	25,300
Narni City	300	4,800
Carbon Plant (Electric Furnace)	50	2,250

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Cervara	6,000	116,000
Nera Montoro 50 cycle	8,400	121,000
Steel Works		
Connected to Network	1,450	32,500
Not connected to Network	700	8,950
Total energy generated.....		278,450

CONSUMPTION
(Measured at Distribution Points except for Florence which is measured at Nera Montoro)

	Peak KW	Average daily consumption KWh
Florence (To Valdarno Company)	9,000	117,000
Terni Plants		
Auxiliary Services	80	1,800
Nera Montoro (Ammonia Plant)	600	12,500
Papigno (Carbide Plant).	700	12,200
Spoleto (Cement Mill & Mines). . . .	1,000	15,300
Steel Works.	1,800	23,000
Terni - Interamna	1,600	25,300
Narni City.	300	4,800
Carbon Plant (Electric Furnace). . .	50	2,250
UNES		
Nera Montoro	800	15,500
Rieti.	800	15,500
Spoleto.	1,800	26,700
Cisa Viscosa (Textiles)	40	810
SIRI (Hydrogen Plant)	600	1,750
Total energy consumption		274,210

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ELECTRIC GENERATION AND CONSUMPTION
ROME AREA

SOURCES

	Average Contribution to Rome Peak KW	Average daily Supply to Rome KWhr
Steam Plants		
A.C.E.A.	7,600	119,000
S.R.E.	8,550	149,000
Hydro Plants	10,350	265,000

APPROXIMATE AVERAGE CONTRIBUTION OF HYDRO PLANTS TO ROME

	Average Contribution to Rome Peak KW	Average daily Supply to Rome KWhr
Nera Montoro	4,000	115,000
Tivoli Group		
Arci	1,190	20,500
Comunacqua	1,470	36,100
Scalelle	1,500	29,100
Subiaco.	1,430	38,500
Vesta.	1,050	25,800

CONSUMPTION - ROME CITY

	Average Peak KW	Average daily Consumption KWhr
	26,500	533,000

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	Average Contribution to Rome Peak KW	Average daily Supply to Rome KWhr
Steam Plants		
A.C.E.A.	7,600	119,000
S.R.E.	8,550	149,000
Hydro Plants	10,350	265,000

APPROXIMATE AVERAGE CONTRIBUTION OF HYDRO PLANTS TO ROME

	Average Contribution to Rome Peak KW	Average daily Supply to Rome KWhr
Nera Montoro	4,000	115,000
Tivoli Group		
Arci	1,190	20,500
Comunacqua	1,470	36,100
Scalelle	1,500	29,100
Subiaco	1,430	38,500
Vesta	1,050	25,800

CONSUMPTION - ROME CITY

	Average Peak KW	Average daily Consumption KWhr
Rome	26,500	533,000

CONSUMPTION - ROME OUTSKIRTS

	Average Peak KW	Average daily Consumption KWhr
Rome North Railway	350	3,200
Rome Province	-	15,400
Subiaco Area	2,500	29,000
Tivoli Area	1,400	12,400

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ELECTRIC GENERATION AND CONSUMPTION
TERNI AREA

GENERATION
(Measured at the Generating Stations)

	Peak KW	Average daily output KWh
Cervara	6,000	116,000
Nera Montoro 50 cycle	8,400	121,000
Steel Works		
Connected to Network	1,450	32,500
Not connected to Network	700	8,950
Total energy generated		278,450

CONSUMPTION
(Measured at Distribution Points except for Florence which is measured at Nera Montoro)

	Peak KW	Average daily consumption KWh
Florence (To Valdarno Company)	9,000	
Terni Plants		117,000
Auxiliary Services	80	1,800
Nera Montoro (Ammonia Plant)	600	12,500
Papigno (Carbide Plant)	700	12,200
Spoleto (Cement Mill & Mines)	1,000	15,300
Steel Works	1,800	25,000
Terni - Interamna	1,600	25,300
Narni City	300	4,800
Carbon Plant (Electric Furnace)	50	

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Cervara	6,000	116,000
Nera Montoro 50 cycle	8,400	121,000
Steel Works		
Connected to Network	1,450	32,500
Not connected to Network	700	8,950
Total energy generated.....		278,450

CONSUMPTION

(Measured at Distribution Points except for Florence which is measured at Nera Montoro)

	Peak KW	Average daily consumption KWh
Florence (To Valdarno Company)	9,000	117,000
Terni Plants		
Auxiliary Services	80	1,800
Nera Montoro (Ammonia Plant)	600	12,500
Papigno (Carbide Plant).	700	12,200
Spoleto (Cement Mill & Mines). . . .	1,000	15,300
Steel Works.	1,800	25,000
Terni - Interamna	1,600	25,300
Narni City.	300	4,800
Carbon Plant (Electric Furnace). . .	50	2,250
UNES		
Nera Montoro	800	15,500
Rieti.	800	15,300
Spoleto.	1,800	26,700
Cisa Viscosa (Textiles)	40	810
SIRI (Hydrogen Plant)	600	1,750
Total energy consumption		274,210

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ROME AREA

SOURCES

	Average Contribution to Rome Peak KW	Average daily Supply to Rome KWhr
Steam Plants		
A.C.E.A.	7,600	119,000
S.R.E.	8,550	149,000
Hydro Plants	10,350	265,000

APPROXIMATE AVERAGE CONTRIBUTION OF HYDRO PLANTS TO ROME

	Average Contribution to Rome Peak KW	Average daily Supply to Rome KWhr
Nera Montoro	4,000	115,000
Tivoli Group		
Arci	1,190	20,500
Comunacqua	1,470	36,100
Scalelle	1,500	29,100
Subiaco.	1,430	38,500
Vesta.	1,050	25,800

CONSUMPTION - ROME CITY

Average Peak KW

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	Average Contribution to Rome Peak KW	Average daily Supply to Rome KWhr
Steam Plants		
A.C.E.A.	7,600	119,000
S.R.E.	8,550	149,000
Hydro Plants	10,350	265,000

APPROXIMATE AVERAGE CONTRIBUTION OF HYDRO PLANTS TO ROME

	Average Contribution to Rome Peak KW	Average daily Supply to Rome KWhr
Nera Montoro	4,000	115,000
Tivoli Group		
Arci	1,190	20,500
Comunacqua	1,470	36,100
Scalelle	1,500	29,100
Subiaco	1,430	38,500
Vosta	1,050	25,800

CONSUMPTION - ROME CITY

	Average Peak KW	Average daily Consumption KWhr
Rome	26,500	533,000

CONSUMPTION - ROME OUTSKIRTS

	Average Peak KW	Average daily Consumption KWhr
Rome North Railway	350	3,200
Rome Province	-	15,400
Subiaco Area	2,500	29,000
Tivoli Area	1,400	12,400

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TERNI AREA

GENERATION
(Measured at the Generating Stations)

	Peak KW	Average daily output KWh
Carvara	6,000	116,000
Nera Montoro 50 cycle	8,400	121,000
Steel Works		
Connected to Network	1,450	32,500
Not connected to Network	700	8,950
Total energy generated		278,450

CONSUMPTION
(Measured at Distribution Points except for Florence which is measured at Nera Montoro)

	Peak KW	Average daily consumption KWh
Florence (To Valdarno Company)	9,000	117,000
Terni Plants		
Auxiliary Services	80	1,800
Nera Montoro (Ammonia Plant)	600	12,500
Papigno (Carbide Plant)	700	12,200
Spoleto (Cement Mill & Mines)	1,000	15,300
Steel Works	1,800	23,000
Terni - Interamna	1,600	25,300
Narni City	300	4,800
Carbon Plant (Electric Furnace)	50	2,250
UNES		
Nera Montoro	800	15,500

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Nera Montoro 50 cycle	5,400	[illegible]
Steel Works		
Connected to Network	1,450	32,500
Not connected to Network	700	8,950
Total energy generated.....		278,450

CONSUMPTION

(Measured at Distribution Points except for Florence which is measured at Nera Montoro)

	Peak KW	Average daily consumption KWh
Florence (To Valdarno Company)	9,000	117,000
Terni Plants		
Auxiliary Services	80	1,800
Nera Montoro (Ammonia Plant)	600	12,500
Papigno (Carbide Plant).	700	12,200
Spoleto (Cement Mill & Mines). . . .	1,000	15,300
Steel Works.	1,800	25,000
Terni - Interamna	1,600	25,300
Narni City.	300	4,800
Carbon Plant (Electric Furnace). . .	50	2,250
UNES		
Nera Montoro	800	15,500
Rieti.	800	15,500
Spoleto.	1,800	26,700
Cisa Viscosa (Textiles)	40	810
SIRI (Hydrogen Plant)	600	1,750
Total energy consumption		274,210

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ROME AREA

SOURCES

	Average Contribution to Rome Peak KW	Average daily Supply to Rome KWhr
Steam Plants		
A.C.E.A.	7,600	119,000
S.R.E.	8,550	149,000
Hydro Plants	10,350	265,000

APPROXIMATE AVERAGE CONTRIBUTION OF HYDRO PLANTS TO ROME

	Average Contribution to Rome Peak KW	Average daily Supply to Rome KWhr
Nera Montoro	4,000	115,000
Tivoli Group		
Arci	1,190	20,500
Comunacqua	1,470	36,100
Scalelle	1,500	29,100
Subiaco.	1,430	38,500
Vosta.	1,050	25,800

CONSUMPTION - ROME CITY

	Average Peak KW	Average daily Consumption KWhr
Rome	26,500	533,000

CONSUMPTION - ROME OUTSKIRTS

Average Consumption

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	Average Contribution to Rome Peak KW	Average daily Supply to Rome KWhr
Steam Plants		
A.C.E.A.	7,600	119,000
S.R.E.	8,550	149,000
Hydro Plants	10,350	265,000

APPROXIMATE AVERAGE CONTRIBUTION OF HYDRO PLANTS TO ROME

	Average Contribution to Rome Peak KW	Average daily Supply to Rome KWhr
Nera Montoro	4,000	115,000
Tivoli Group		
Arci	1,190	20,500
Comunacqua	1,470	36,100
Scalelle	1,500	29,100
Subiaco	1,430	38,500
Vesta	1,050	25,800

CONSUMPTION - ROME CITY

	Average Peak KW	Average daily Consumption KWhr
Rome	26,500	535,000

CONSUMPTION - ROME OUTSKIRTS

	Average Peak KW	Average daily Consumption KWhr
Rome North Railway	350	3,200
Rome Province	-	15,400
Subiaco Area	2,500	29,000
Tivoli Area	1,400	12,400

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ELECTRIC GENERATION AND CONSUMPTION
TERNI AREA

GENERATION
(Measured at the Generating Stations)

	Peak KW	Average daily output KWh
Cervara	6,000	116,000
Nera Montoro 50 cycle	8,400	121,000
Steel Works		
Connected to Network	1,450	32,500
Not connected to Network	700	8,950
Total energy generated.....		278,450

CONSUMPTION
(Measured at Distribution Points except for Florence which is measured at Nera Montoro)

	Peak KW	Average daily consumption KWh
Florence (To Valdarno Company)	9,000	117,000
Terni Plants		
Auxiliary Services	80	1,800
Nera Montoro (Ammonia Plant)	600	12,500
Papigno (Carbide Plant)	700	12,200
Spoleto (Cement Mill & Mines)	1,000	15,300
Steel Works	1,800	25,000
Terni - Interamna	1,600	25,300
Narni City	300	4,800
Carbon Plant (Electric Furnace)	50	2,250
UNES		
Nera Montoro	800	15,500

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.....	3,000	118,000
Nera Montoro 50 cycle	8,400	121,000
Steel Works		
Connected to Network	1,450	32,500
Not connected to Network	700	8,950
Total energy generated.....		278,450

CONSUMPTION
(Measured at Distribution Points except for Florence
which is measured at Nera Montoro)

	Peak KW	Average daily consumption KWh
Florence (To Valdarno Company)	9,000	117,000
Terni Plants		
Auxiliary Services	80	1,800
Nera Montoro (Ammonia Plant)	600	12,500
Papigno (Carbide Plant).	700	12,200
Spoleto (Cement Mill & Mines). . . .	1,000	15,300
Steel Works.	1,800	23,000
Terni - Interamna	1,600	25,300
Narni City.	300	4,800
Carbon Plant (Electric Furnace). . .	50	2,250
UNES		
Nera Montoro	800	15,500
Rieti.	800	15,300
Spoleto.	1,800	26,700
Cisa Viscosa (Textiles)	40	810
SIRI (Hydrogen Plant)	600	1,750
Total energy consumption		274,210

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ELECTRIC GENERATION AND CONSUMPTION
ROME AREA

SOURCES

	Average Contribution to Rome Peak KW	Average daily Supply to Rome KWhr
Steam Plants		
A.C.E.A.	7,600	119,000
S.R.E.	8,550	149,000
Hydro Plants	10,350	265,000

APPROXIMATE AVERAGE CONTRIBUTION OF HYDRO PLANTS TO ROME

	Average Contribution to Rome Peak KW	Average daily Supply to Rome KWhr
Nera Montoro	4,000	115,000
Tivoli Group		
Arci	1,190	20,500
Comunacqua	1,470	36,100
Scalelle	1,500	29,100
Subiaco.	1,430	38,500
Vosta.	1,050	25,800

CONSUMPTION - ROME CITY

	Average Peak KW	Average daily Consumption KWhr

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	Average Contribution to Rome Peak KW	Average daily Supply to Rome KWhr
Steam Plants		
A.C.E.A.	7,600	119,000
S.R.E.	8,550	149,000
Hydro Plants	10,350	265,000

APPROXIMATE AVERAGE CONTRIBUTION OF HYDRO PLANTS TO ROME

	Average Contribution to Rome Peak KW	Average daily Supply to Rome KWhr
Nera Montoro	4,000	115,000
Tivoli Group		
Arci	1,190	20,500
Comunegun	1,470	36,100
Scalelle	1,500	29,100
Subiaco	1,430	38,500
Vesta	1,050	25,800

CONSUMPTION - ROME CITY

	Average Peak KW	Average daily Consumption KWhr
Rome	26,500	533,000

CONSUMPTION - ROME OUTSKIRTS

	Average Peak KW	Average daily Consumption KWhr
Rome North Railway	350	3,200
Rome Province	-	15,400
Subiaco Area	2,500	29,000
Tivoli Area	1,400	12,400

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ELECTRIC GENERATION AND CONSUMPTION
TERNI AREA

GENERATION
(Measured at the Generating Stations)

	Peak KW	Average daily output KWh
Cervara	6,000	116,000
Nera Montoro 50 cycle	8,400	121,000
Steel Works		
Connected to Network	1,450	32,500
Not connected to Network	700	8,950
Total energy generated.....		278,450

CONSUMPTION
(Measured at Distribution Points except for Florence which is measured at Nera Montoro)

	Peak KW	Average daily consumption KWh
Florence (To Valdarno Company)	9,000	117,000
Terni Plants		
Auxiliary Services	80	1,800
Nera Montoro (Ammonia Plant)	600	12,500
Papigno (Carbide Plant).	700	12,200
Spoleto (Cement Mill & Mines). . . .	1,000	15,300
Steel Works.	1,800	23,000
Terni - Interrama	1,600	25,300
Narni City.	300	4,800
Carbon Plant (Electric Furnace)		

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	Peak KW	Average daily output KWh
Cervara	6,000	116,000
Nera Montoro 50 cycle	8,400	121,000
Steel Works		
Connected to Network	1,450	32,500
Not connected to Network	700	8,950
Total energy generated		278,450

CONSUMPTION

(Measured at Distribution Points except for Florence which is measured at Nera Montoro)

	Peak KW	Average daily consumption KWh
Florence (To Valdarno Company)	9,000	117,000
Terni Plants		
Auxiliary Services	80	1,800
Nera Montoro (Ammonia Plant)	600	12,500
Papigno (Carbide Plant)	700	12,200
Spoleto (Cement Mill & Mines)	1,000	15,500
Steel Works	1,800	25,000
Terni - Interamna	1,600	25,300
Narni City	300	4,800
Carbon Plant (Electric Furnace)	50	2,250
UNES		
Nera Montoro	800	15,500
Rieti	800	15,300
Spoleto	1,800	26,700
Cisa Viscosa (Textiles)	40	810
SIRI (Hydrogen Plant)	600	1,750
Total energy consumption		274,210

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ROME AREA

SOURCES

	Average Contribution to Rome Peak KW	Average daily Supply to Rome KWhr
Steam Plants		
A.C.E.A.	7,600	119,000
S.R.E.	8,550	149,000
Hydro Plants	10,350	265,000

APPROXIMATE AVERAGE CONTRIBUTION OF HYDRO PLANTS TO ROME

	Average Contribution to Rome Peak KW	Average daily Supply to Rome KWhr
Nera Montoro	4,000	115,000
Tivoli Group		
Arci	1,190	20,500
Comunacqua	1,470	36,100
Scalelle	1,500	29,100
Subiaco	1,430	38,500
Vesta	1,050	25,800

CONSUMPTION - ROME CITY

	Average Peak KW	Average daily Consumption KWhr
Rome	26,500	533,000

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Steam Plants		
A.C.E.A.	7,600	119,000
S.R.E.	8,550	149,000
Hydro Plants	10,350	265,000

APPROXIMATE AVERAGE CONTRIBUTION OF HYDRO PLANTS TO ROME

	Average Contribution to Rome Peak KW	Average daily Supply to Rome KWhr
Nera Montoro	4,000	115,000
Tivoli Group		
Arci	1,190	20,500
Comunacqua	1,470	36,100
Scalelle	1,500	29,100
Subiaco	1,430	38,500
Vosta	1,050	25,800

CONSUMPTION - ROME CITY

	Average Peak KW	Average daily Consumption KWhr
Rome	26,500	535,000

CONSUMPTION -- ROME OUTSKIRTS

	Average Peak KW	Average daily Consumption KWhr
Rome North Railway	350	3,200
Rome Province	--	15,400
Subiaco Area	2,500	29,000
Tivoli Area	1,400	12,400

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TERNI AREA

GENERATION
(Measured at the Generating Stations)

	Peak KW	Average daily output KWh
Cervara	6,000	116,000
Nera Montoro 50 cycle	8,400	121,000
Steel Works		
Connected to Network	1,450	32,500
Not connected to Network	700	8,950
Total energy generated		278,450

CONSUMPTION
(Measured at Distribution Points except for Florence which is measured at Nera Montoro)

	Peak KW	Average daily consumption KWh
Florence (To Valdarno Company)	9,000	117,000
Terni Plants		
Auxiliary Services	80	1,800
Nera Montoro (Ammonia Plant)	600	12,500
Papigno (Carbide Plant)	700	12,200
Spoleto (Cement Mill & Mines)	1,000	15,300
Steel Works	1,800	25,000
Terni - Interenna	1,600	25,300
Narni City	300	4,800
Carbon Plant (Electric Furnace)	50	2,250

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Nera Montoro [illegible]		
Steel Works		32,500
Connected to Network	1,450	8,950
Not connected to Network	700	
Total energy generated		278,450

CONSUMPTION
(Measured at Distribution Points except for Florence which is measured at Nera Montoro)

	Peak KW	Average daily consumption KWh
Florence (To Valdarno Company)	9,000	117,000
Terni Plants		
Auxiliary Services	80	1,800
Nera Montoro (Ammonia Plant)	600	12,500
Papigno (Carbide Plant)	700	12,200
Spoleto (Cement Mill & Mines)	1,000	15,300
Steel Works	1,800	23,000
Terni - Interamna	1,600	25,300
Narni City	300	4,800
Carbon Plant (Electric Furnace)	50	2,250
UNES		
Nera Montoro	800	15,500
Rieti	800	15,300
Spoleto	1,800	26,700
Cisa Viscosa (Textiles)	40	810
SIRI (Hydrogen Plant)	600	1,750
Total energy consumption		274,210

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ELECTRIC GENERATION AND CONSUMPTION
ROME AREA

SOURCES

	Average Contribution to Rome Peak KW	Average daily Supply to Rome KWhr
Steam Plants		
A.C.E.A.	7,600	119,000
S.R.E.	8,550	149,000
Hydro Plants	10,350	265,000

APPROXIMATE AVERAGE CONTRIBUTION OF HYDRO PLANTS TO ROME

	Average Contribution to Rome Peak KW	Average daily Supply to Rome KWhr
Nera Montoro	4,000	115,000
Tivoli Group		
Arci	1,190	20,500
Comunacqua	1,470	36,100
Scalelle	1,500	29,100
Subiaco.	1,430	38,500
Vosta.	1,050	25,800

CONSUMPTION - ROME CITY

	Average Peak KW	Average daily Consumption KWhr
Rome	26,500	533,000

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	to Rome Peak KW	to Rome KWhr
Steam Plants		
A.C.E.A.	7,600	119,000
S.R.E.	8,550	149,000
Hydro Plants	10,350	265,000

APPROXIMATE AVERAGE CONTRIBUTION OF HYDRO PLANTS TO ROME

	Average Contribution to Rome Peak KW	Average daily Supply to Rome KWhr
Nora Montoro	4,000	115,000
Tivoli Group		
Arci	1,190	20,500
Comunacqua	1,470	36,100
Scalolle	1,500	29,100
Subiaco.	1,430	38,500
Vesta.	1,050	25,800

CONSUMPTION - ROME CITY

	Average Peak KW	Average daily Consumption KWhr
Rome	26,500	533,000

CONSUMPTION - ROME OUTSKIRTS

	Average Peak KW	Average daily Consumption KWhr
Rome North Railway	350	3,200
Rome Province	-	15,400
Subiaco Area	2,500	29,000
Tivoli Area	1,400	12,400

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ELECTRIC GENERATION AND CONSUMPTION
TERNI AREA

GENERATION
(Measured at the Generating Stations)

	Peak KW	Average daily output KWh
Corvara	6,000	116,000
Nera Montoro 50 cycle	8,400	121,000
Steel Works		
Connected to Network	1,450	32,500
Not connected to Network	700	8,950
Total energy generated.....		278,450

CONSUMPTION
(Measured at Distribution Points except for Florence which is measured at Nera Montoro)

	Peak KW	Average daily consumption KWh
Florence (To Valdarno Company)	9,000	117,000
Terni Plants		
Auxiliary Services	80	1,800
Nera Montoro (Ammonia Plant)	600	12,500
Papigno (Carbide Plant).	700	12,200
Spoleto (Cement Mill & Mines). . . .	1,000	15,300
Steel Works.	1,800	25,000
Terni - Interamna	1,600	25,300
Narni City.	300	4,800

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Cervara	6,000	116,000
Nera Montoro 50 cycle	8,400	121,000
Steel Works		
Connected to Network	1,450	32,500
Not connected to Network	700	8,950
Total energy generated.....		278,450

CONSUMPTION

(Measured at Distribution Points except for Florence which is measured at Nera Montoro)

	Peak KW	Average daily consumption KWh
Florence (To Valdarno Company)	9,000	117,000
Terni Plants		
Auxiliary Services	80	1,800
Nera Montoro (Ammonia Plant)	600	12,500
Papigno (Carbide Plant).	700	12,200
Spoleto (Cement Mill & Mines). . . .	1,000	15,300
Steel Works.	1,800	25,000
Terni - Interamna	1,600	25,300
Narni City.	300	4,800
Carbon Plant (Electric Furnace). . .	50	2,250
UNES		
Nera Montoro	800	15,500
Rieti.	800	15,300
Spoleto.	1,800	26,700
Cisa Viscosa (Textiles)	40	810
SIRI (Hydrogen Plant)	600	1,750
Total energy consumption		274,210

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ELECTRIC GENERATION AND CONSUMPTION
ROME AREA

SOURCES

	Average Contribution to Rome Peak KW	Average daily Supply to Rome KWhr
Steam Plants		
A.C.E.A.	7,600	119,000
S.R.E.	8,550	149,000
Hydro Plants	10,350	265,000

APPROXIMATE AVERAGE CONTRIBUTION OF HYDRO PLANTS TO ROME

	Average Contribution to Rome Peak KW	Average daily Supply to Rome KWhr
Nera Montoro	4,000	115,000
Tivoli Group		
Arci	1,190	20,500
Comunacqua	1,470	36,100
Scalelle	1,500	29,100
Subiaco.	1,430	38,500
Vesta.	1,050	25,800

CONSUMPTION - ROME CITY

	Average Peak KW	Average daily Consumption KWhr
Rome	26,500	533,000

CONSUMPTION - ROME OUTSKIRTS

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Steam Plants		
A.C.E.A.	7,600	119,000
S.R.E.	8,550	149,000
Hydro Plants	10,350	265,000

APPROXIMATE AVERAGE CONTRIBUTION OF HYDRO PLANTS TO ROME

	Average Contribution to Rome Peak KW	Average daily Supply to Rome KWhr
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Comunepar	1,470	36,100
Scalelle	1,500	29,100
Subiaco	1,430	38,500
Vesta	1,050	25,800

CONSUMPTION - ROME CITY

	Average Peak KW	Average daily Consumption KWhr
Rome	26,500	533,000

CONSUMPTION - ROME OUTSKIRTS

	Average Peak KW	Average daily Consumption KWhr
Rome North Railway	350	3,200
Rome Province	-	15,400
Subiaco Area	2,500	29,000
Tivoli Area	1,400	12,400

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ELECTRIC GENERATION AND CONSUMPTION
TERNI AREA

GENERATION
(Measured at the Generating Stations)

	Peak KW	Average daily output KWh
Cervara	6,000	116,000
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Steel Works		
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Rieti.	800	15,300
Spoleto.	1,800	26,700
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Total energy consumption		274,210

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ELECTRIC GENERATION AND CONSUMPTION
ROME AREA

SOURCES

	Average Contribution to Rome Peak KW	Average daily Supply to Rome KWhr
Steam Plants		
A.C.E.A.	7,600	119,000
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Scalelle	1,500	29,100
Subiaco	1,430	38,500
Vosta	1,050	25,800

CONSUMPTION - ROME CITY

	Average Peak KW	Average daily Consumption KWhr
Rome	26,500	535,000

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Tivoli Group		
Arci	1,190	20,500
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Scalelle	1,500	29,100
Subiaco.	1,430	38,500
Vesta.	1,050	25,800

CONSUMPTION - ROME CITY

	Average Peak KW	Average daily Consumption KWhr
Rome	26,500	535,000

CONSUMPTION -- ROME OUTSKIRTS

	Average Peak KW	Average daily Consumption KWhr
Rome North Railway	350	5,200
Rome Province	-	15,400
Subiaco Area	2,500	29,000
Tivoli Area	1,400	12,400

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