

# The Second World War and Industrial Development in Siberia

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**Abstract** — At the beginning of the Second World War (in Russia it is called Great Patriotic War) the Soviet Union performed enormous operation having no analog in the history - hundreds of factories and plants were moved from the European part of the country over thousand of kilometers to the east – to the Ural, Siberia and the Far East. These evacuated factories formed the ground of industrial development of the Eastern part of the country and the Central Asia Republics during the second part of the XX<sup>th</sup> century. There was created the powerful bases of electrical, electronic, nuclear and space industry. The paper describes the beginning of the industrial revolution in the field of the electrical and electronic industry in the 40-50<sup>th</sup> of the last century in some Siberian cities – Tomsk, Novosibirsk, Krasnoyarsk.

**Index Terms** — Second World War, factories' and plants' evacuation, Siberia, Novosibirsk, Krasnoyarsk, Tomsk, electrical and electronics development.

## I. INTRODUCTION

At the beginning of the fortieth when it became clear that the Second World War is unavoidable, the government of Russia (the Soviet Union at that time) had to solve the very important problem - only the European part of the country was well industrially developed. In case of the war this industry could be at once destroyed (as it really happened) which would be the death of the country.

In the first days of the War there were lost two big industrial centers – Minsk and Riga. The Central and Eastern Ukraine, Moscow and Leningrad regions were under threat – they could be occupied or destroyed by the German aviation.

So already at the beginning of July 1941 the Soviet government has taken the principal decision – to evacuate main industrial plants, especially those providing weapon, to the East.

On a whole since July till November 1941 1523 industrial units, 1360 of them big plans, were evacuated Easter: 226 to the Volga region, 667 to the Ural, 244 to the West Siberia, 78 to the East Siberia, 308 to Kazakhstan and Central Asia. Railway carried 1.5 millions of wagons of "evacuated goods".

In October-November only from Moscow were evacuated 498 factories and about 210 thousand workers [1].

Enormous efforts of people working 12-14 hors a day under unbearable conditions made the evacuated equipment produce

production in a month and a half after being installed at the new place.

Evacuation of industry at the second part of 1941 and at the beginning of 1942, its "installation" is one of the overwhelming organization and human heroic deeds of the Soviet Union during the War.

## II. SIBERIAN CITIES BEFORE THE WAR

Before the Second World War Siberia was a vast underpopulated country where the trans-Siberian rail 10 thousand kilometers long, crossing the whole Russia from the western border to the Pacific Ocean, was built at the end of 19<sup>th</sup> – the beginning of 20<sup>th</sup> centuries.

Tomsk, founded in 1604 as a fortress at the eastern border of Russia, became the important centre of transit commerce. In 1804 it became the centre of a vast province, including the present-day Republic Altai, Altai region, Kemerovo region, Novosibirsk and Tomsk regions, East Kazakhstan and part of Krasnoyarsk region. In 1880 the first beyond the Ural University was opened in Tomsk, which made the city one of the cultural and educational centers of the country.

Before the War there was neither industry nor convenient means of communication in the city. Only one small plant produced equipment for mines. Population of Tomsk was 144 thousand.



Figure 1. Tomsk before the War.

Krasnoyarsk was founded in 1628 also as a fortress to protect from Kirgiz worriers. Later it became one of the important points on the trans-Siberian railway. Before the War

there was some industry in the city - the most important were machine building, aircraft repair and ship building factories. Population of Krasnoyarsk was 200 thousand.

Novosibirsk, now the capital of West Siberia, was founded in 1903 (at the beginning it was called Novonikolaevsk) at the place where trans-Siberian railway crosses the river Ob. In 1912 it became a very important railway junction, where begins the way to the Altai region. In 1915 there were only 70 thousand peoples in Novosibirsk. At the beginning of the War the number became 400 thousand. The biggest factory before the War in Novosibirsk was "Sibmashstroï" producing pumps and flax sketchers.

On a whole the industry in Siberia had a local character answering the needs of population. The all-country importance had only trans-Siberian railway, Kuzbass coal mines and Kuznetsk metallurgical complex. There were no plants at the vast territory of Siberia producing electronics.

### III. SIBERIA IN YEARS OF THE WAR

At the beginning of the War 19 enterprises were evacuated to Tomsk from the European part of the country [2].

The plant producing equipment for mines gave roof to three evacuated factories: the plant "Pnevmatika" from Leningrad, "Red Metallist" from Konotop and the plant of surveyor instruments from Kharkov (now Ukraine).

In February 1940 the factory to produce electric motors started being built in Tomsk. The area was used when on the 10<sup>th</sup> of August 1941 the first train with the equipment and people from the factory "Elektrosila" came from Leningrad. On the 28<sup>th</sup> of November there were produced the first motors and sent to the army. On the 29<sup>th</sup> of November a numerous grope of people and a set of equipment came from Yaroslavl and on the 21<sup>st</sup> of December there were manufactured the fist electric motors.

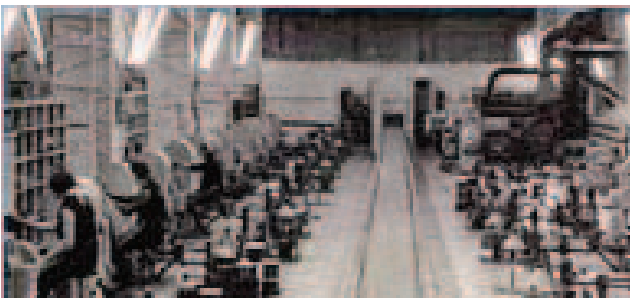


Figure 2. In the plant "Sibelectromotor", 1942.

In 1942 1640 people worked at the plant "Electromotor" (see Figure 2). Table 1 shows the dynamics of motor and tank starter production by this plant during the War.

The factory of electric lamps, the factory of electric-electronic measuring equipment, the factory producing electric cables, the factory of mechanical instruments and others were moved to Tomsk from the European part of the country. They still are functioning in Tomsk.

TABLE I  
EVOLUTION OF ELECTRIC MOTOR PRODUCTION

Years	1941	1942	1943	1944	1945
The number of motors produced	28	19300	29000	47000	53100
The number of motors among them for the army	8	7300	9400	26700	33800

The plant is still working (see Figure 3). Only during one 2010 year there were designed and produced 136 new types of motors.



Figure 3. In the plant "Sibelectromotor", 2005.

The factory producing electric cables was evacuated from Moscow as well as the factory of electric lamps. The first thousand of lamps for aircrafts was produced by the 15<sup>th</sup> of December 1941. During the following sixty years the number of produced lamps of different types became 4.6 billions.

The factory of measuring instruments was organized on the bases of Leningrad plant "Radist" and Moscow Radio Factory. During the War 55 950 units of equipment were produced.

New industry needed energy. So the electric power station was evacuated to Tomsk from Gomel (now Belorussia).

Before and during the War fifty electrical, electronic, mechanical and chemical firms moved from Moscow, Leningrad, Kalinin, Novgorod, Odessa, Sevastopol and others to Omsk, Novosibirsk, Krasnoyarsk.

First echelons from the front-line area came to Novosibirsk on the 3<sup>rd</sup> of July 1941, two weeks after the beginning of the War. To Novosibirsk and the region there were evacuated 120 factories, about 380 thousand people, 124 thousand among them from Leningrad. The population of Novosibirsk became 1.5 times more numerous. Many of these factories gave birth to the industry in Siberia [3].

In 1936 Novosibirsk plant "Sibmashstroï" was transformed into the "Enterprise of Aircraft Industry No 153" (later the plant named after Tchkalov) and it became the first in the World to produce fighters.

In 1944 17 fighters went every day to the front from Novosibirsk, though more then half of the workers were 12-14 year boys from the nearby villages. They worked very hard

getting 700 grams of bread a day. Since 1941 till 1945 women and teenagers supplied the troops at the front with 550 regiments of fighters providing advantage in the air over Germany.

22 firms were evacuated in 1941 to Krasnoyarsk, 8 among them worked fully for the front. 620 trains with evacuated equipment (more than 31 thousand of wagons) came to Krasnoyarsk. More than 75 thousand of people were evacuated. They lived barracks and dugouts, 2.5 m<sup>2</sup> for a person (see Figure 4).



Figure 4. Krasnoyarsk in 1941.

On the 21st of July 1941 the first group of people (117) and the equipment of the electro technical plant were evacuated from Leningrad to Krasnoyarsk. Production of aerodrome transmitters-receivers was organized using this equipment.

In 1947 on the bases of this plant was organized the firm "Radiocommunication" producing transmitters of different types and wireless beacons.

Among evacuated plants were steam-locomotive-building plant from Brjansk region (now "Sibtjazhmash"), steam-locomotive-building plant from Moscow and machine building plant from Kaluga (now "Krasnmash"), machine building plant from Karelia (now "Siblesmash"), the firm producing details of aircrafts from Tula region [4].

#### IV. SIBERIA AFTER WAR

All this gave start to the fast development of industry in the following years. High rate of industrial development of Siberia during the Second World War preserved later. During the "cold war" the main resources of the state have been used to strengthen the defense industry. There were built many new plants to produce goods of double function.

In Tomsk there were built and reconstructed plant of radio engineering devices, instrument plant, the plant of measuring devices, the research institute of semiconductor devices, the plant of computers and some others.

In the sixties there was organized the Tomsk Branch of the Russian Academy of Science with the Institute of Atmosphere Optics, the Institute of High Current Electronics and others.

In 1949 Tomsk Polytechnic Institute (now Technical University) opened the faculty of radio engineering to teach

engineers for the electronic industry of the region. In 1962 there was organized the first in Siberia specialized radio electronic high school – Tomsk Institute of Radioelectronics and Electronic Engineering (now Tomsk State University of Control Systems and Radioelectronics), which graduates created the staff bases of Siberian electronic industry.

New industrial units developed fast during the last years. One of them is the firm "Micran" with the staff of 1200 people and the full cycle of design and production of UHF equipment and a new factory of integrated circuits under construction [5].

In 1948 in Novosibirsk there was organized the plant to produce uranium, now it supplies nuclear fuel for power and research reactors [6]. There are 214 big and middle size firms in the city with 421.2 thousand people, many plants of heavy, energy and precise machinery as well as the research institute to design the radar and communication systems.

Research schools of the Siberian Division of Russian Academy of Science in Novosibirsk Akademgorodok are known all over the World. There are 32 high schools in the city including 11 Universities. The biggest in the area Technical University has 22 thousand students; some of them are electronic and electrical students.

In 1950 the firm of synthetic caoutchouc, in 1951 the firm "Sibelektrostal" started production in Krasnoyarsk. In 1955 there was organized the Institute of physics named after L. Kirenski, in the sixties there was built the Krasnoyarsk Akademgorodok.

There are many firms of space industry in Krasnoyarsk, as well as the industry non-ferrous metallurgy, machine building, woodwork, transport and chemical industry. Especially important is "Krasnmash" producing ballistic rockets, speeding blocks for rockets "Zenit" and "Proton", firms growing polysilicon crystals, oil-gas and other equipment [7]. The firm "Radiocommunications" design and produce mobile and stationary stations of space communication and troposphere relay lines [8].

In the fifties and sixties in Tomsk and Krasnoyarsk regions there were built city satellites Seversk and Zheleznogorsk with nuclear stations, production and storing of enriched nuclear materials [9, 10]. In Zheleznogorsk is the Joint-Stock Company "Academician M.F. Reshetnev Information Satellite Systems" – one of leading Russian corporation of the space industry. This firm produced more than 1200 space apparatus, including all satellites for the Russian navigation system "GLONASS" [11].

#### V. CONCLUSION

The Second World War gave a powerful push of industrial development of Siberia, which used to be backward underpopulated agricultural area. During and after the War it became well developed industrial area with up-to-date industry of fuel-energy, machine building, instrument making, electronic, space and nuclear industry. Novosibirsk became



the third city of Russia by population (1.5 million), population of Krasnoyarsk region 1 million, Tomsk - 500 thousand.

In parallel with the industry development Siberia became the centre of science and education. After Moscow and San-Petersburg Tomsk is considered the third educational centre with six Universities. Successful is the Siberian Branch of the Academy of Science in Novosibirsk. In Krasnoyarsk is functioning the Siberian Federal University.

The appearance of the cities has changed, their architecture and ecology are of the world level, high is the cultural and education level of the population (see Figures 5-7).



Figure 5. Modern Tomsk.



Figure 6. Modern Krasnoyarsk.



Figure 7. Modern Novosibirsk.

Process of Siberia development started in the years of the Second World War is going on.

So I have to say once again - wars are cruel and nasty events but sometimes they make people think of the future.

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