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History of the Russian Nuclear Weapons Program

History of the Russian Nuclear Weapon Program

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Yalta Conference February 4–11, 1945



April 12, 1945

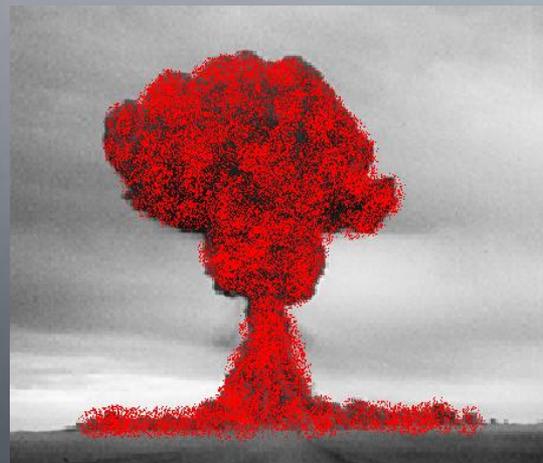
Potsdam Conference was held at Potsdam, Occupied Germany. The Trinity test occurred on July 16, 1945 or the day before the conference began. Passed notes that “the baby was born,” Truman and Churchill knew of the successful test. When informed by Truman, Stalin seemed unimpressed. Soviet espionage that had penetrated the joint US/UK atomic weapons program had already informed him.



Potsdam Conference, July 17- August 2, 1945

История русской ядерной программы

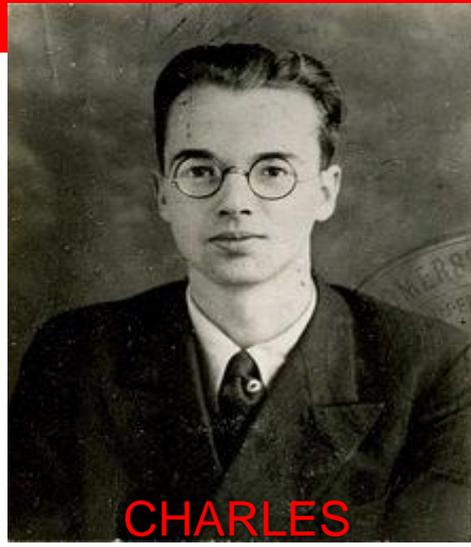
THE SOVIET PATH FORWARD VIA ESPIONAGE



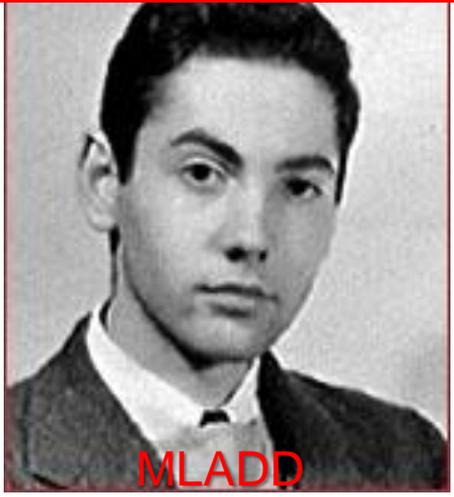
USSR'S ATOMIC SPIES "TRACK FOUR"

"ENORMOZ" (Russians term for the Manhattan Project)

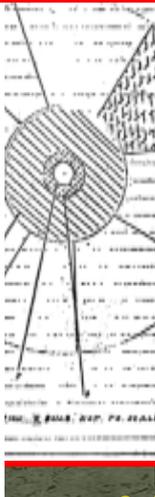
(Background documents, declassified and used in Federal trial of Rosenbergs)



Klaus Fuchs



Theodore Hall



David Greenglass



Harry Gold



Saville Sax



Ethel & Julius Rosenberg



Владимир Барковски
USSR Consulate,
NYC

Персей Perseus

- a. Joined the Manhattan Project in 1942
- b. Physicist passed information to the Cohens
- c. Associated with the Spanish Civil War
- d. Still alive and in the USA as of October 1992



PERSEUS
SPIONAGE IN LOS ALAMOS



aka Helen and Peter Kroger

Morris and Lona Cohen, handlers of Perseus, fled to the UK under the names Helen and Peter Kroger. After their arrest and prosecution in the UK, they were exchanged for Gerald Brooke and flown to Russia where they were welcomed as heroes.



George Koval Code Name "Delmar"



George Koval



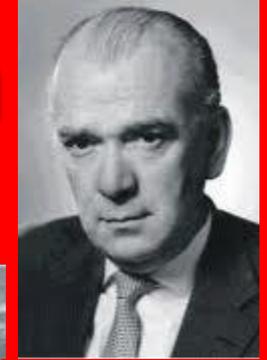
George Koval died in Moscow on 31 January 2006. His role was never officially recognized until 2 November 2007, when the Kremlin announced his posthumous decoration with the highest state honor, "Hero of Russia." Cited among his major contributions to the Soviet atomic project was the design of the "neutron fuse" for the first Soviet atomic device, which was tested on August 23, 1949. Koval was cited for "his courage and heroism while carrying out special missions and was the only Soviet intelligence officer to infiltrate the Manhattan Project's secret plants."

История русской ядерной программы

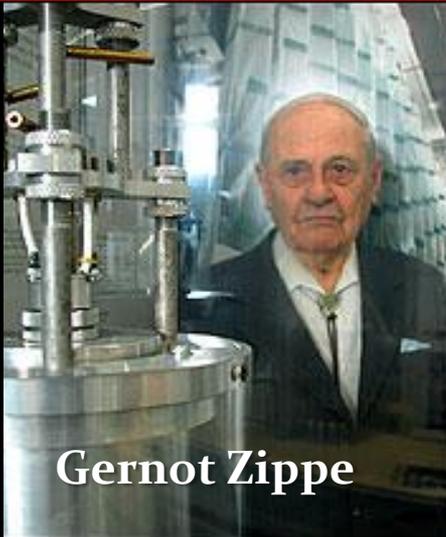
EARLY DEVELOPMENTAL PATH DOWN TO JOE-1



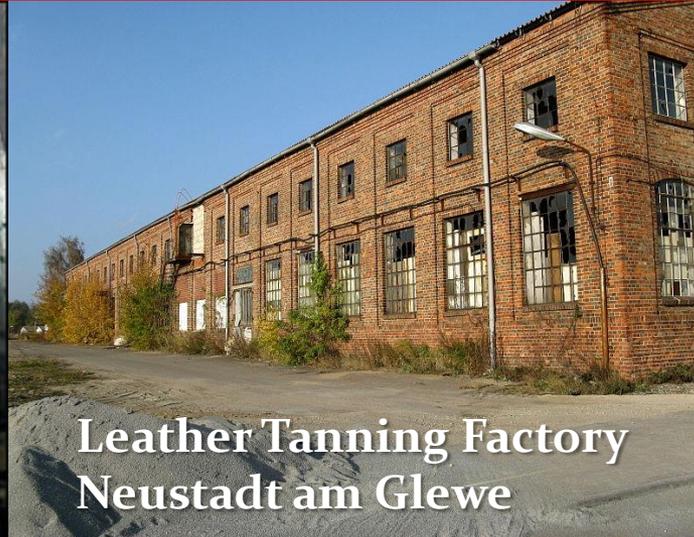
Contributions of Third Reich Knowledge and Materials



Riehl



Gernot Zippe



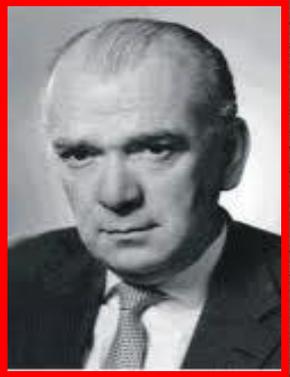
Leather Tanning Factory
Neustadt am Glewe



Auergesellschaft Plant
Oranienburg

For the Soviet nuclear weapons program, the most significant contribution from the defeated Third Reich was the location and seizure of 300 tons of uranium, 100 tons from the heavily bombed Auergesellschaft plant in Oranienburg and 100 tons from a leather tanning factory in Neustadt am Glewe. This material was used to fuel Reactor "A" located in the Urals that provided plutonium for JOE-1. In addition, German scientists such as Nicholas Riehl and Gernot Zippe provided the Russians with information on uranium metallurgy and enrichment. Likewise, captured German rocket technicians and rockets (such as the Wasser Fall) helped "jump start" the Russian IRBM and ICBM programs.

Former Third Reich Scientists Who Assisted in the Russian Nuclear Weapons Program



Nicholas
Riehl



Karl
Zimmer



Robert
Doepel



Manfred von
Ardenne



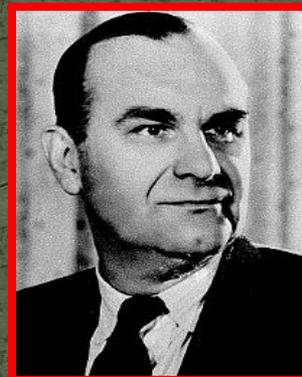
Peter
Thiessen



Max
Volmer



Gernot
Zippe



Heinz
Barwich



Gustav
Hertz

Design Department N11

aka Arzamas 16



On 9 April 1946, a secret statement of the USSR Soviet of Ministers was adopted, establishing the Design Department N11 (KB-11) under the auspices of the Second Laboratory of the Academy of Sciences. General Pavel Zernov, the production manager, headed KB-11, whereas Yuri Khariton was assigned responsibility for the scientific issues.



Arzamas-16

Арзамас-16

AKA Sarov
or VNIIEF



Sakharov's Home



St. Seraphim Church



I. Kurchatov



A. Sakharov



Y. Khariton



G. Flerov



The pressure to test with a 100% chance of success.....

РАССЕКРЕЧЕНО
 Служба внешней разведки *Ф 10
 СССР
 859

Бомба типа "А" (High explosive).

В ходе работы в 1944 г. ожидается производство первого взрыва атомной бомбы.

Конструкция бомбы. Атомным веществом этой бомбы является элемент 94 вес. применения урана-235. В центре ядра из плутония весом 5 килограммами помещается так наз. инициатор - ферридиево-селенный источник альфа-частиц. Плутоний окружён 50 фунтами тьюв-аклей^{x)}, который является "теплоизоляцией". Над это помещается в оболочку из алюминия толщиной 11 см. Эта алюминиевая оболочка, в свою очередь, окружён изнутри взрывчатого вещества "пенталит" или "composition" (по другим данным "Composition B") с толстой стеной 46 см. Корпус бомбы, в который помещается это БЗ, имеет внутренний диаметр 140 см. Общий вес бомбы включая пенталит, корпус и проч. - около 3 тонн.

Ожидается, что сила взрыва бомбы будет равна силе взрыва 5.000 тонн ТНТ (коэффициент полезного действия - 3-6%). Мощность "fission" равна $75 \cdot 10^{24}$.

Виды активного материала.

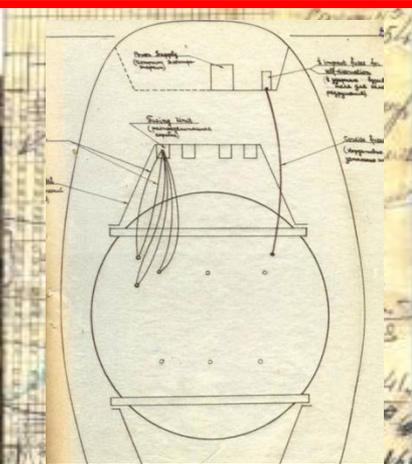
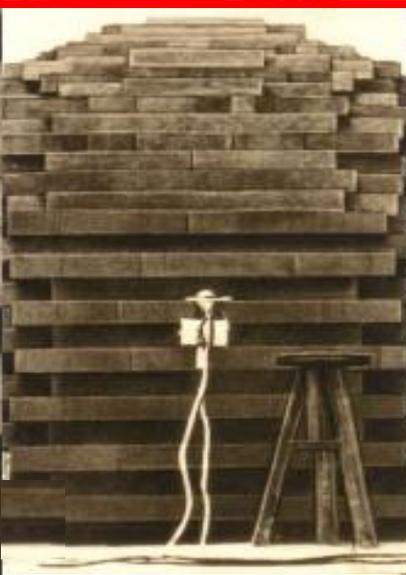
а) Уран-235. На апрель с/г было добыто 25 килограммов Уран-235. К июлю добыча в настоящее время составит 7,5 кг. в месяц.

б) Плутоний (элемент 94). В декабре-2 имелось 6,5 кг. плутония. Плутоний его добыча, нам добыча через плутоний.

x) тьюв-аклей - условное название урана (commercial radium for...)
 (используемый в качестве топлива для реактора)

Ориентировочная взрыв ожидается 10 июля с/г.

Примечания: Состав составлен...
 для устной ориентировки на Кураторство



Fuch's "Fat Man" Diagram 12

KURCHATOV CITY

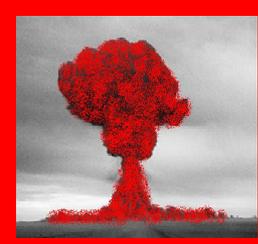


From 1949 to 1993, at least 456 nuclear weapon tests were conducted in a remote part of eastern Kazakhstan, in the province of Semipalatinsk. Kurchatov City was the entry point for the three major test areas --- (1) Experimental Field where the first Russian test (Joe-1) occurred, (2) Balapan where atmospheric tests occurred, and (3) Degelen Mountain where underground tests were carried out. Locals called “Kurchatov City” “Haw Gopoð” or “Our Town.”

Kurchatov City (2013)



Lavrenty Pavlovich Beria



Beria was appointed the administrative leader of the Soviet nuclear weapon program. Kurchatov remained in charge of the scientific research. Shortly after the atomic bombings of Japan in 1945, Stalin issued an ultimatum to Beria ordering the “bomb” to be built and tested within five years. NKVD Special Department “S” was established by Beria to organize intelligence documents gathered about the U.S. bomb and to accelerate the research efforts. The bomb was ready for testing within four years. The Russian scientists would have preferred testing their own design but opted for a copy of the US Trinity device because Beria had informed them that they would be executed if the test failed.

SHIPMENT OF JOE-1 DEVICE TO SEMIPALATINSK BY RAIL

August 1949





JOE 1 Test



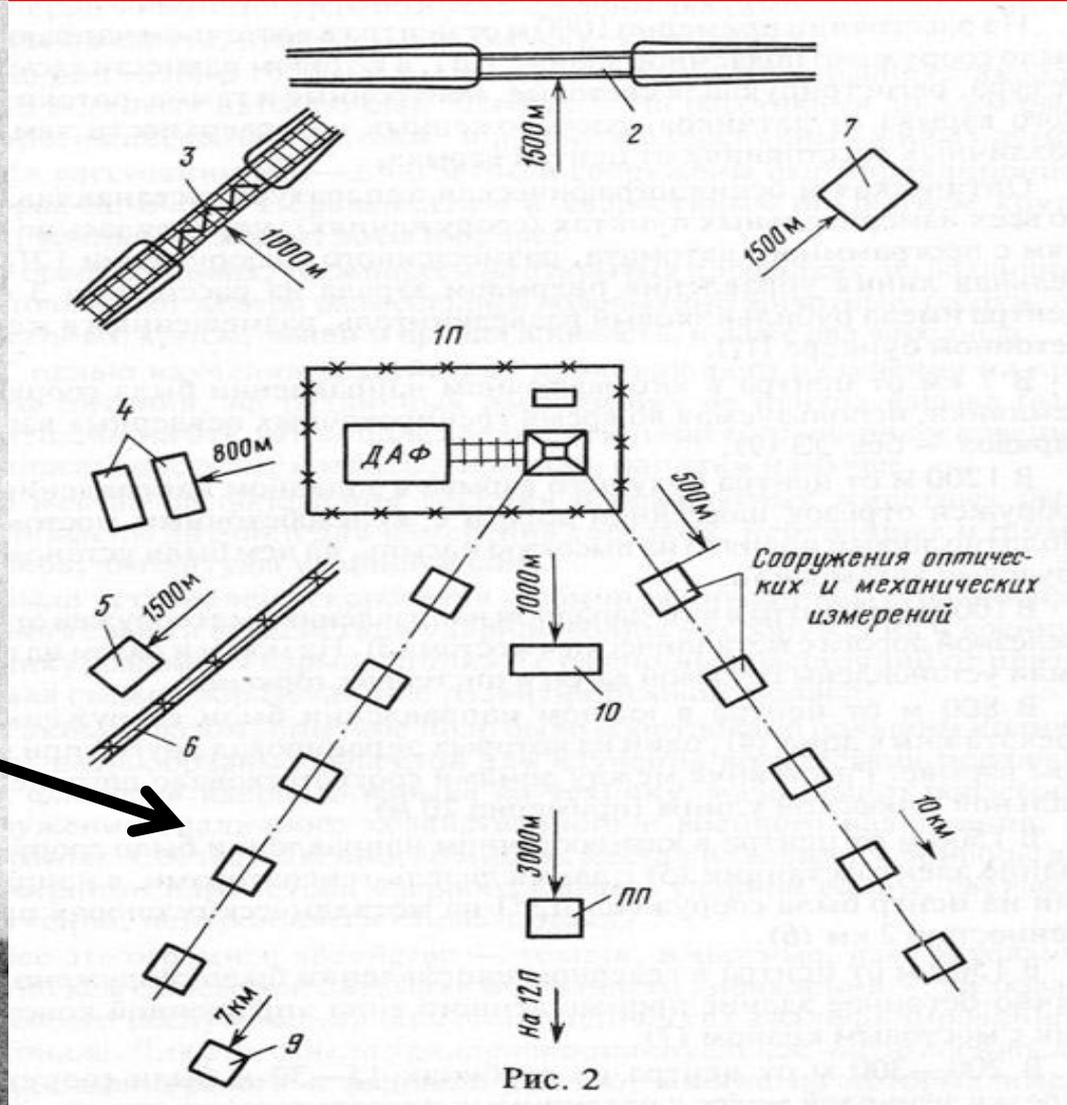
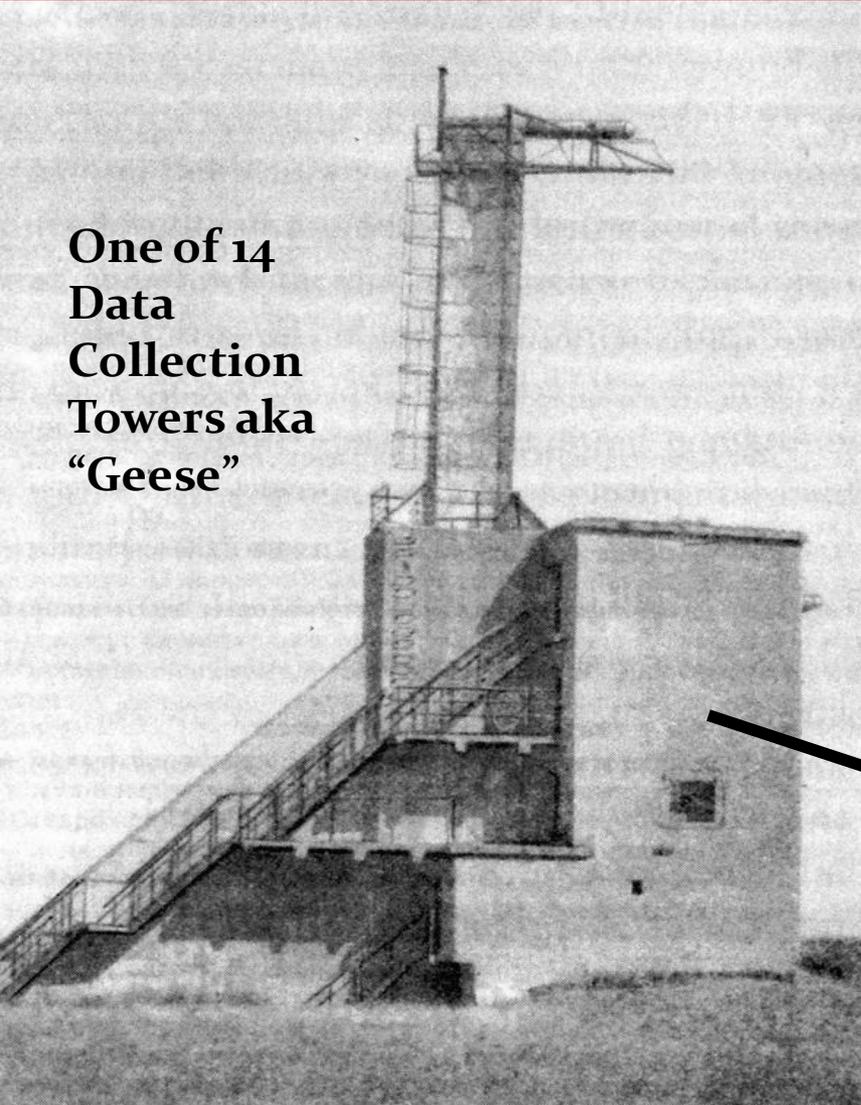
Data Collection
Tower "Goose"



JOE 1 Experimental Layout Plan

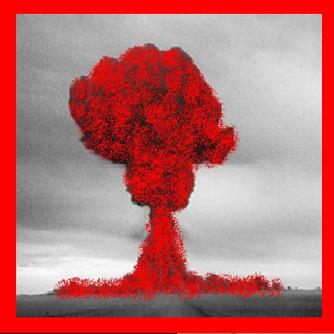


One of 14
Data
Collection
Towers aka
“Geese”



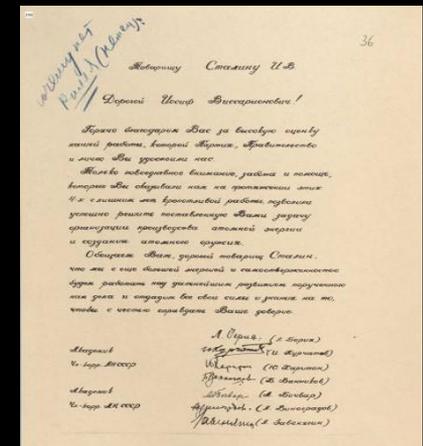
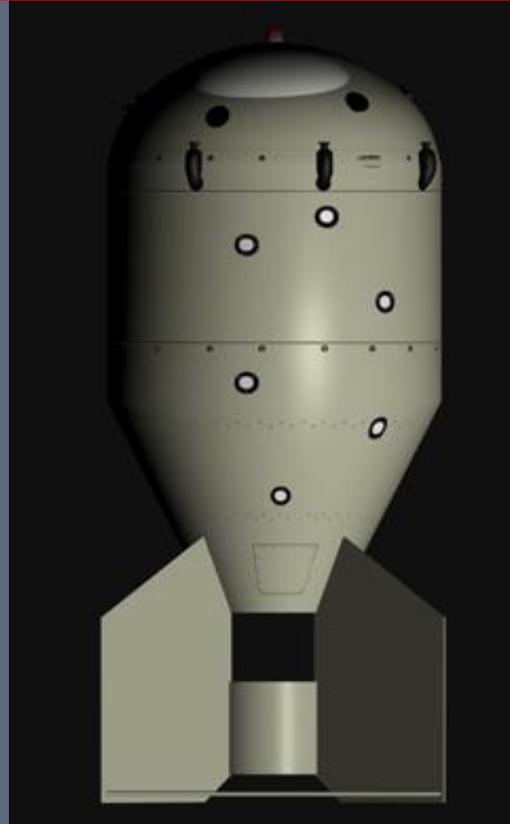
JOE-1 Test Layout Model

Effects seem more important than the device



JOE-1* *First Lightning*

29 August 1949

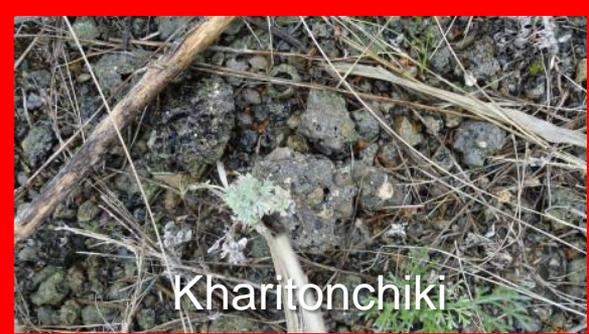


РДС-1 (RDS-1 or Reaktivnyi Dvigatel Stalina) was a copy of the Trinity (Fat Man) device and demonstrated that Russia could manufacture and test nuclear weapons. As promised, executioners in black leather were in the bunker at the time of the test. The letter is from Beria and the scientists thanking Stalin for his leadership in the success. In the blue note at the top left, Stalin responded, "Where is Nicholas Riehl's signature?"

JOE-1 Control & Observation Bunker



JOE-1 Crater

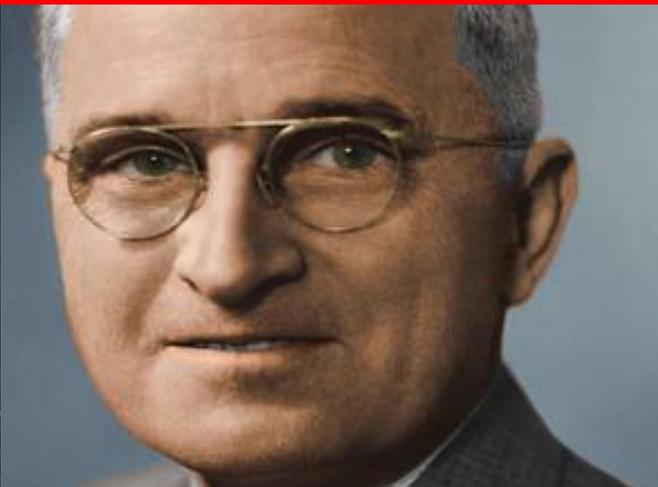


President Truman Announces Russian Test

Harry S. Truman



U.S. Postage 8 cents



COMPLETE NEWS The Sun COMPLETE NEWS
SCHOOLS PICTURES

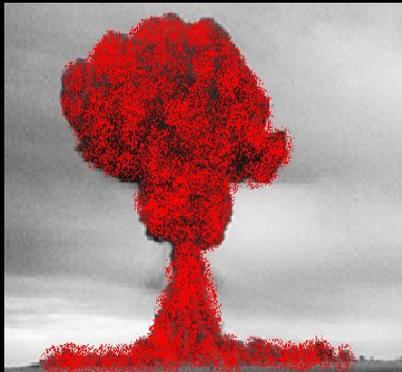
**TRUMAN SAYS RUSSIA
SET OFF ATOM BLAST**

New York World-Telegram EXPLOSION TOOK
E IN RECENT WEEKS

ATOMIC BLAST IN RUSSIA

Of interest -- one day before President Truman's announcement of the 1 September 1949 test-- an intelligence estimate produced by the CIA's Office of Research and Estimates (ORE) assessed that mid-1953 would be "the most probable date for a Soviet nuclear test." This assessment paper was coming off the presses when filter papers loaded with radiological debris from JOE-1 were being taken off AFLOAT-1 aircraft.





THE DETECTION OF JOE 1

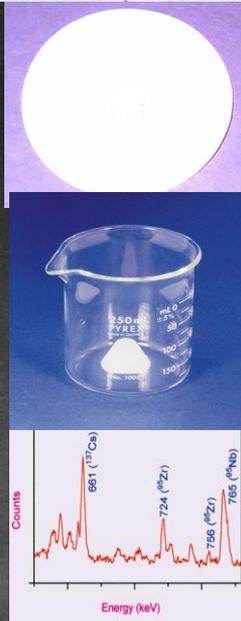
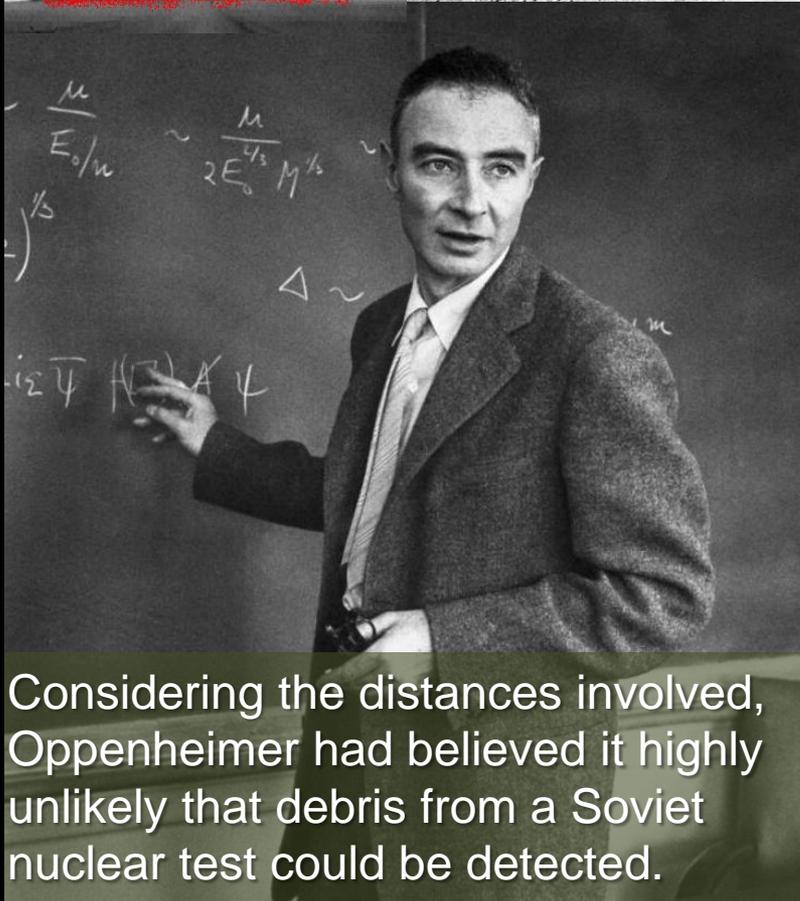
Doyle L. Northrup

Donald H. Rock¹

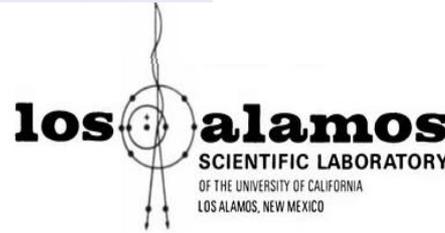
Alert 112 began just like many of the previous 111 sounded in the Long Range Detection System. A field unit reported on 3 September 1949 that a filter paper exposed for three hours at 18,000 feet on a weather plane flying from Japan to Alaska showed a radioactivity of 85 counts per minute, 35 counts over the recently halved official threshold of significance. But this time the slight indication was to trigger a massive reaction.

Before it was over, the Air Weather Service had mounted 92 special air sampling flights from Guam to the North Pole and from Japan to the British Isles. As the radioactive cloud moved east, British authorities were alerted and the RAF flew missions from Gibraltar to 70°N latitude. Other samples were taken by fixed air sampling stations in the Far East and North America and by Navy rainwater stations in North America.

Analyses of the air filter samples by Air Force's contractor Tracerlab and the Los Alamos Scientific Laboratory provided unambiguous evidence that the Soviets had succeeded in detonating a plutonium bomb. The rainwater samples, analyzed by the Naval Research Laboratory, the Los Alamos lab, and the University of California Radiation Laboratory, later told more about the nature and timing of the shot. The U.S. conclusion was independently confirmed by the British sampling and radiochemical analysis.



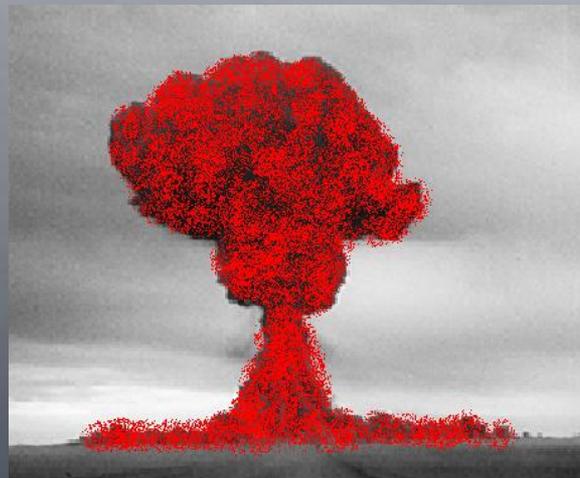
Considering the distances involved, Oppenheimer had believed it highly unlikely that debris from a Soviet nuclear test could be detected.





История русской ядерной программы

NUCLEAR WEAPON TESTING AFTER JOE-1



Semipalatinsk Nuclear Test Site



Lake Chagan



BALAPAN COMPLEX

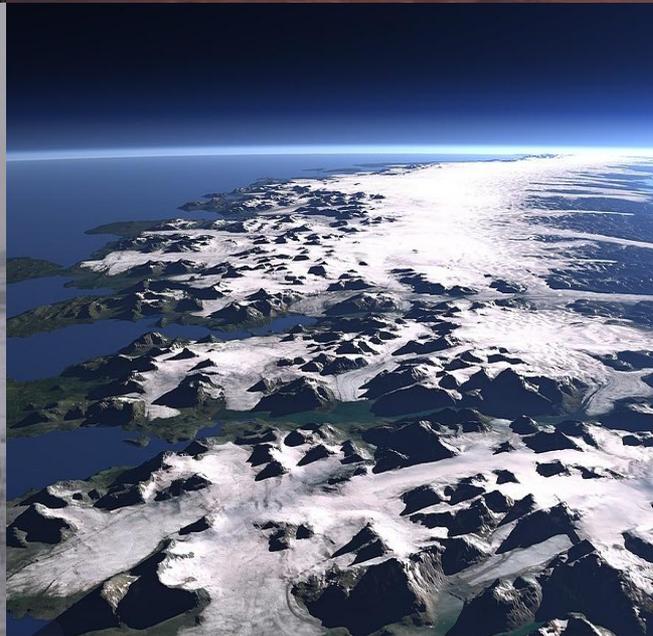
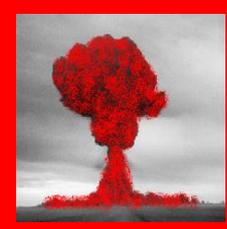


Degelen Gora Nuclear Test Site



<http://www.youtube.com/watch?v=kPLQ4yEXFPc>

Novaya Zemlya Nuclear Test Site



Novaya Zemlya Nuclear Test Site Support Base



Novaya Zemlya Nuclear Test Site



Novaya Zemlya Nuclear Test Site (cont'd)



~40 Instrumentation
Vans

Joe-2 Uranium Implosion, Tritium Boosted

38 KT

24 September 1951

- It is likely that the Joe-2 design was provided to the Chinese. From 1958 until 1959, Arzamas-16 weaponeers led by Colonel E. A. Negin, N. G. Maslov and V. Gavrilov were assigned to China and provided the Chinese with extensive information on 1950-vintage fission weapons. Qian Sanqiang was the primary interface.
- After Klaus Fuchs was released from prison on 23 Jun 1959 and moved to East Germany, he met with Qian and authenticated the design information Russia had given to China.

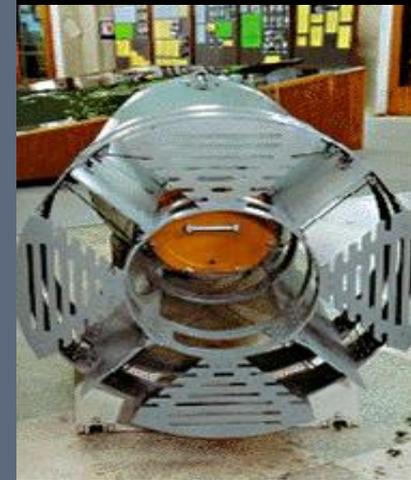
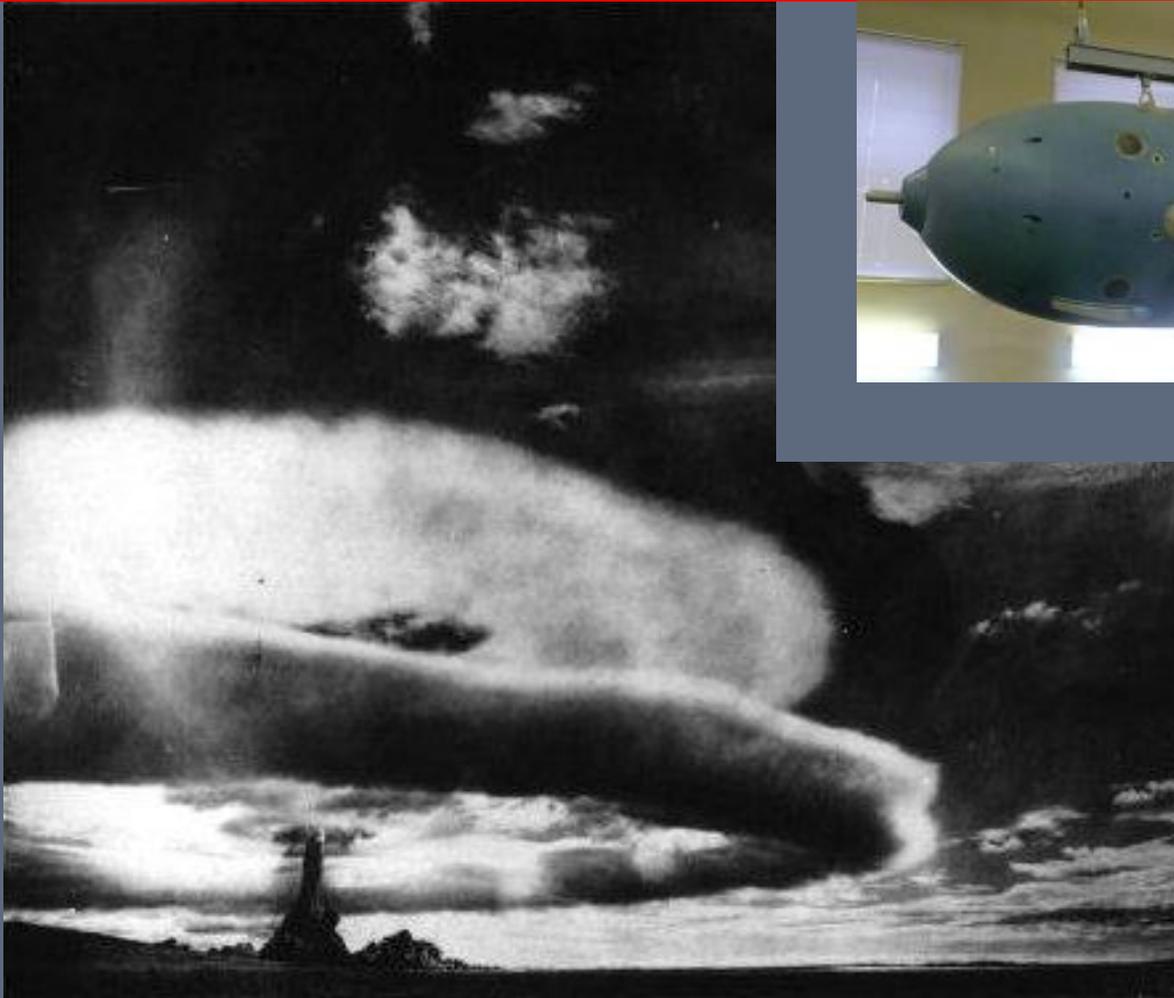


**CHIC 1: 16 OCT/64, 20 KT,
TOWER, FISSION DEVICE
IMPLOSION OF
U-235 CORE, BUT WITHOUT
TRITIUM BOOST**

JOE-3 First Soviet Airdropped Test

41.2 KT

18 October 1951



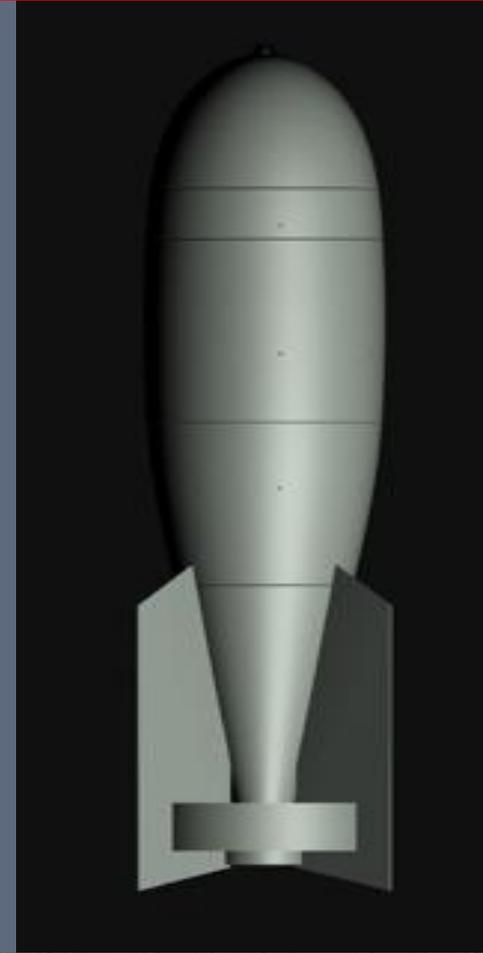
JOE-4 "Layer Cake"

12 August 1953

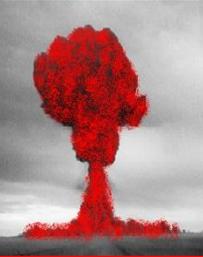
400 KT



РДС-6с



*RDS-6c employed a design called the Слойка, a type of layer cake.



JOE-5

РДС-4

The RDS-4 (JOE-5) design would also be introduced into the Russian arsenal as the warhead for the R-5M medium-range ballistic missile

23 August 1953



RDS-4 (JOE-5) was a fission device using plutonium in a "levitated" core design. The test was an air drop on August 23, 1953, yielding 28 KT.

JOE-8 TOTSKOYE RANGE, ORENBERG

РДС-6

Exercise "Snezhok" (Snowball)

14 September 1953

First Soviet nuclear explosion in a military training exercise involved ~45,000 troops. Totskoye Range, the location for *Snezhok* was chosen because its topography was similar to West Germany. Regrettably for the Russians, wind carried the airdropped device and its detonation debris toward the participants. Thousands of Russian soldiers were contaminated.



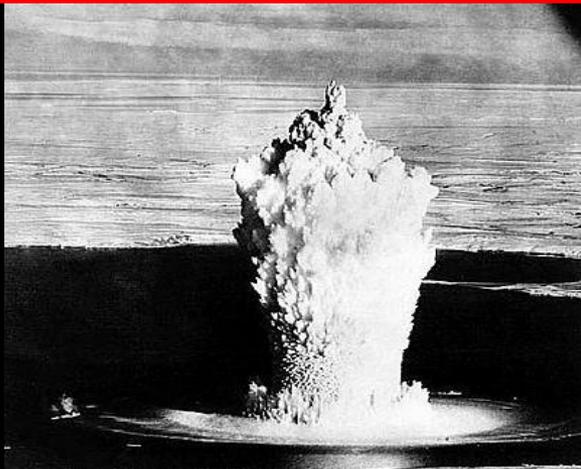


JOE-17

First successful NZ test

Guba Chernaya, Novaya Zemlya

21 September 1955



The first test of the РДС-9 design on 19/10/1954 was a fissile.

JOE-19 STAGED THERMONUCLEAR DEVICE

РДС-37 Бинарная 3.0 MT >1.6 MT 22 November 1955



Utilized “staged, radiation implosion” called “Sakharov’s Third Idea”



JOE-111 Tsar Bomb

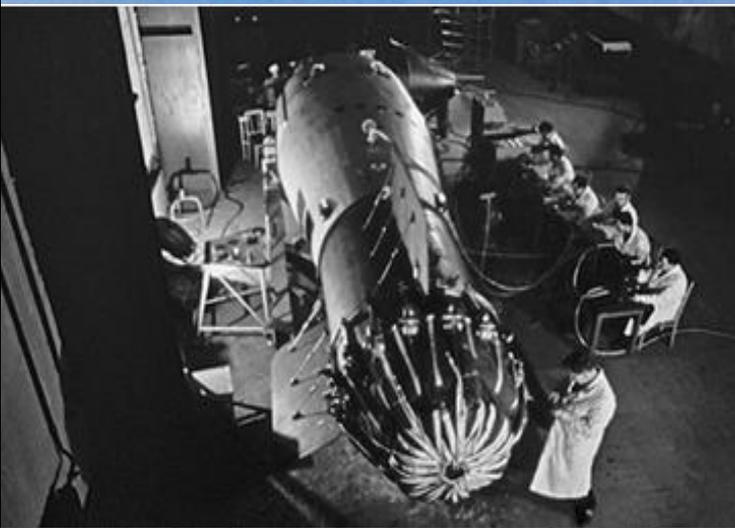
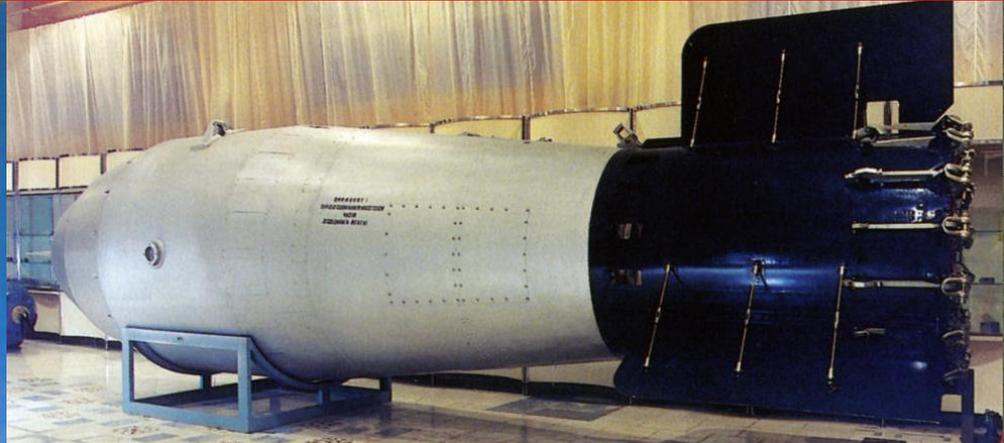
АН-602 Царь-бомба

~50 MT

30 October 1961



Test drop

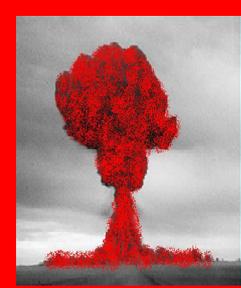


Chagan PNE "Atomic Lake"

Чаган МЯВ

"Industrial Nuclear Explosion"

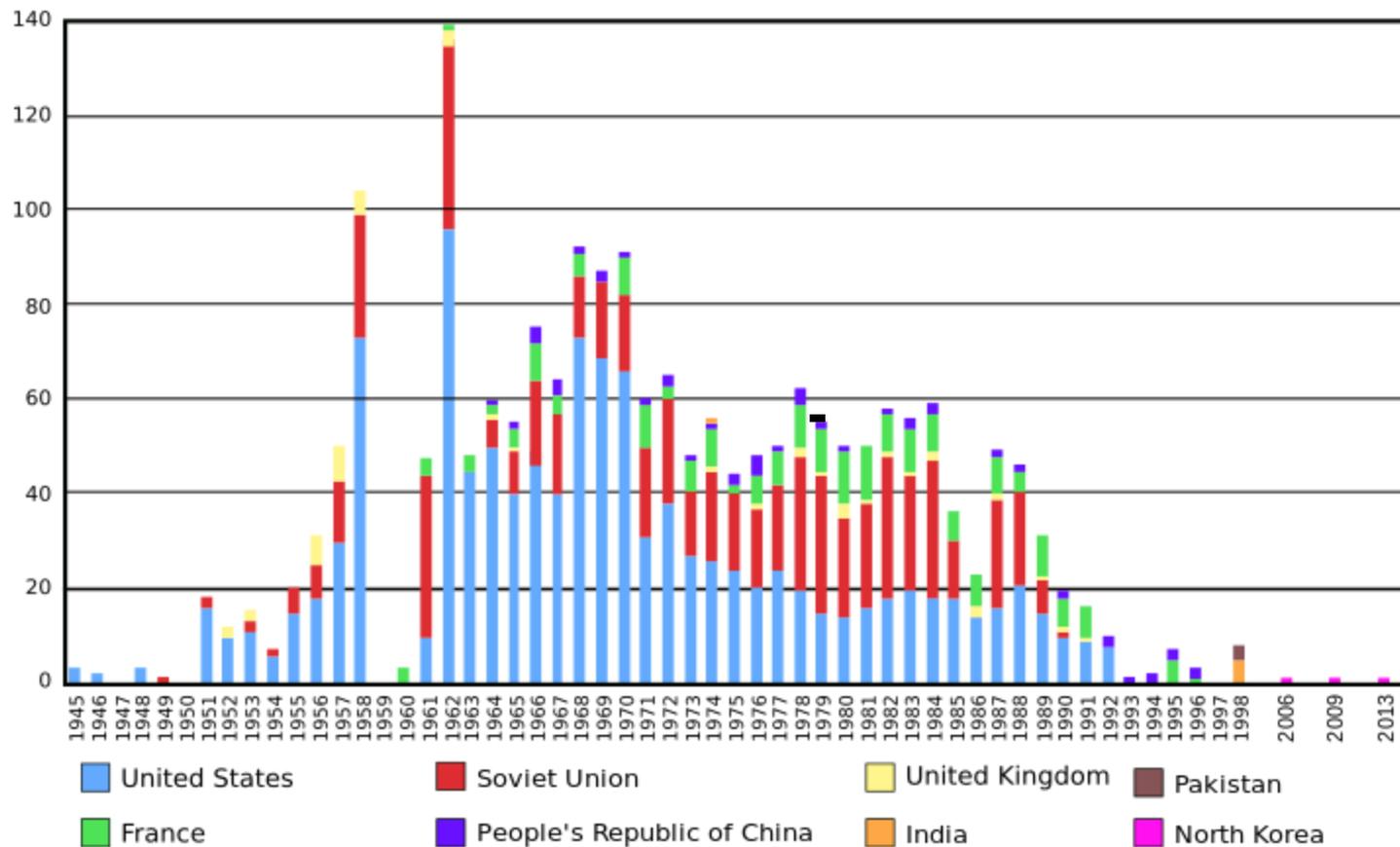
140 KT - 15 January 1965



Aggregate Declared and Detected Tests 1945-2013



Worldwide nuclear testing, 1945 - 2013



Russian Nuclear Weapon Complex





Russian Nuclear Weapon Complex

Sarov, Arzamas-16, Sarova, Avangard Nuclear Weapon Physics/Design,
Nuclear Weapon Assembly/Disassembly

Snezhinsk, Chelyabinsk-70, Kasli Nuclear Weapon Physics/Design

Ozersk, Mayak, Chelyabinsk-65 (40) Plutonium Production, **Tritium**
Production, Weapon Component Fabrication

Zelenogorsk, Krasnoyarsk-26, Dodonovo Plutonium Production

Tomsk-7, Seversk Plutonium Production, **Uranium Enrichment**

Zelenogorsk, Krasnoyarsk-45, Uranium Enrichment

Angarsk, Uranium Enrichment

Novoural'sk, Sverdlovsk-44 Uranium Enrichment

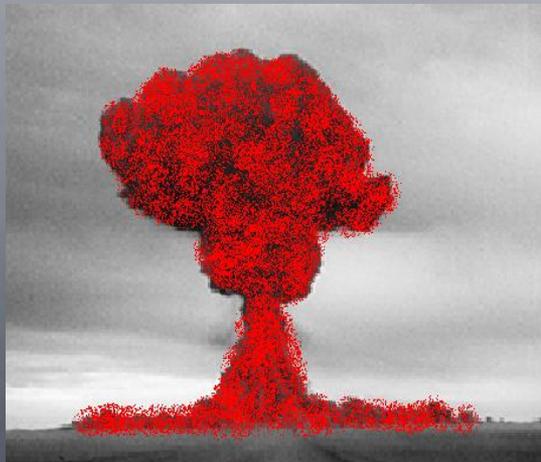
Zarechny, Penza-19 Nuclear Weapon Assembly/Disassembly

Lesnoy, Sverdlovsk-45, Nuclear Weapon Assembly/Disassembly, Weapon
Component Fabrication

Tryokhgorny, Zlatoust-36 Nuclear Weapon Assembly/Disassembly

Novaya Zemlya Nuclear Test Site (former Semipalatinsk, Degelen Gora)

RESEARCH AND DEVELOPMENT INSTITUTES





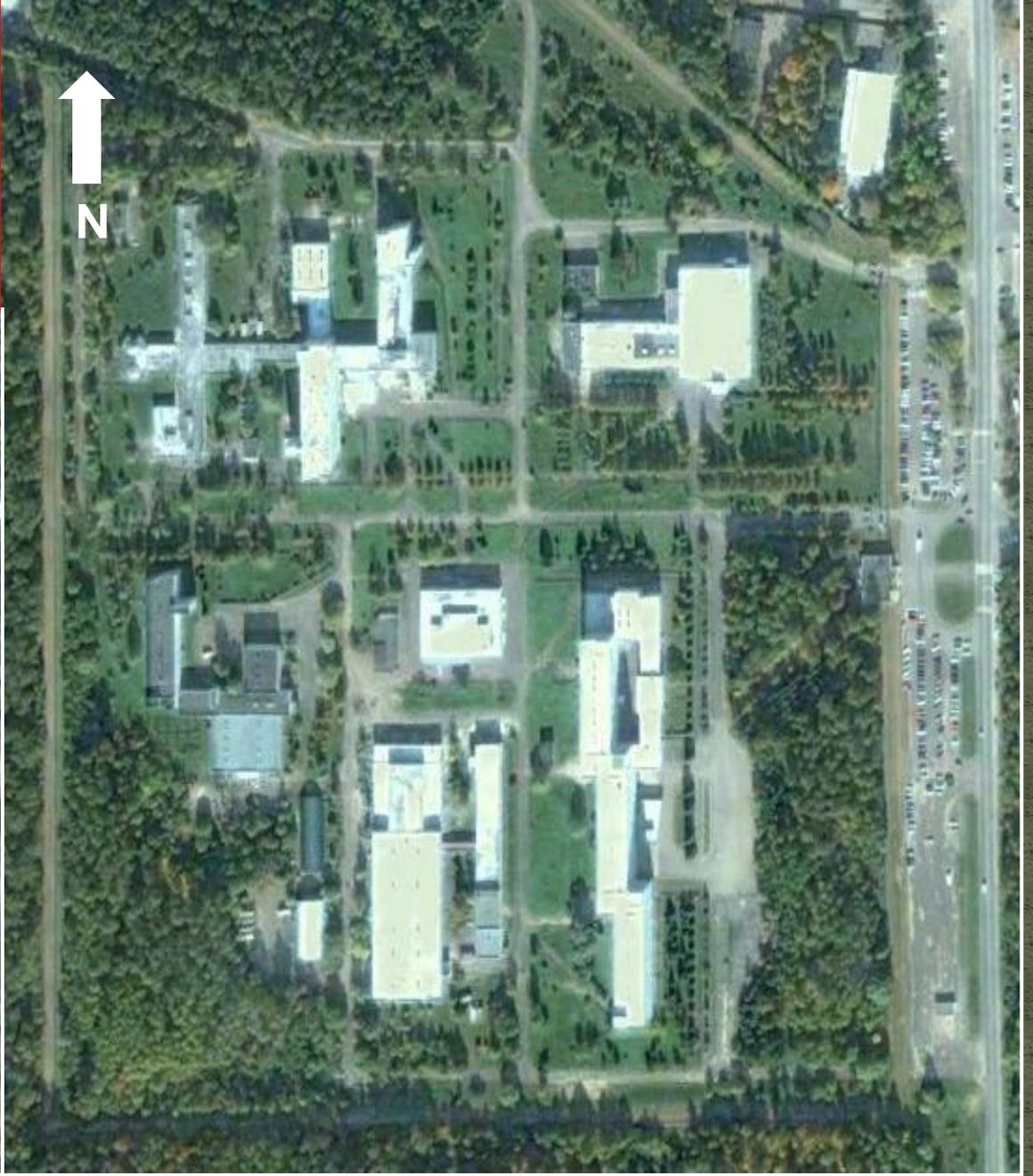
Sarov ARZAMAS-16 VNIIEF



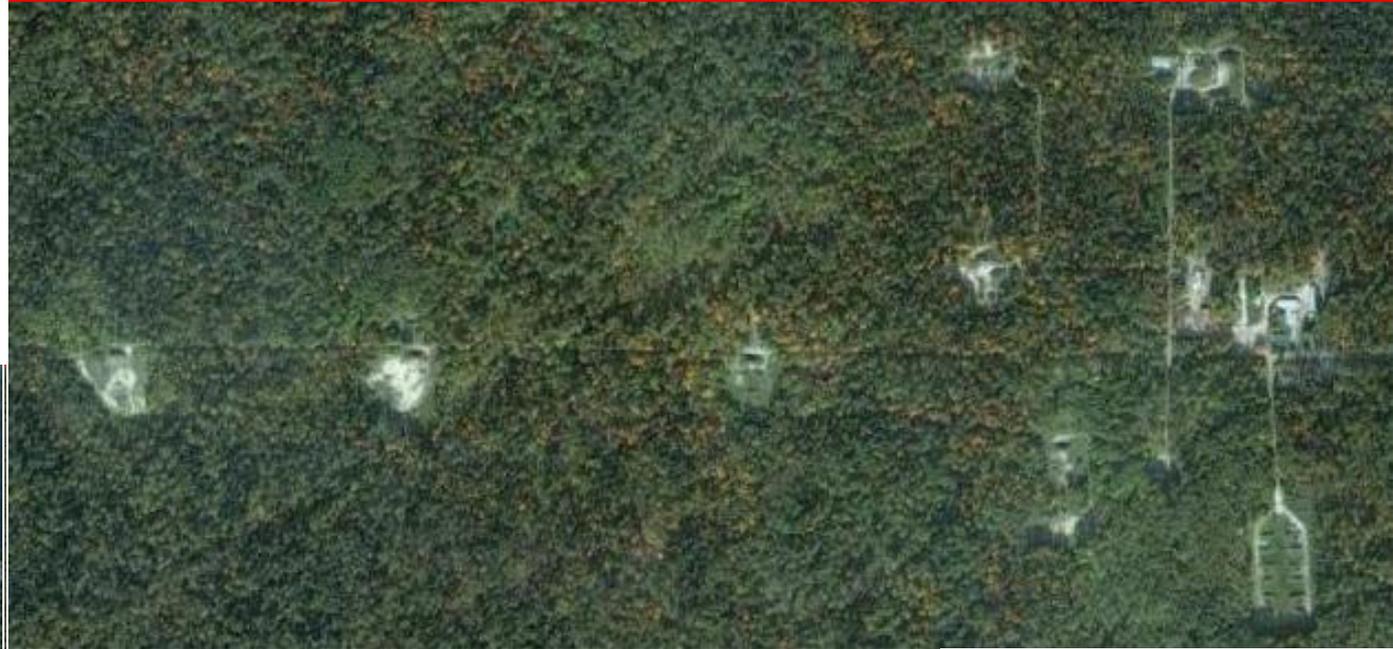
ALL-RUSSIAN RESEARCH INSTITUTE OF EXPERIMENTAL PHYSICS



- Founded 1946 at Sarov (Arzamas-16)
- Stewardship of the Russian nuclear stockpile and improved efficiency, safety and reliability of nuclear warheads
- Development of combined computer simulation methods for various physics phenomena using advanced high-performance computing systems
- Advanced design methods for complex engineering systems
- Hydrodynamics of transients, detonation physics and technology;
- Nuclear physics and radiation physics
- Development and operation of research reactors for the purposes of science
- Development and operation of technologies for control and accountability of nuclear materials
- Science and technology support of the international arms limitation and nuclear nonproliferation treaties



Facilities Arzamas-16 / 2012

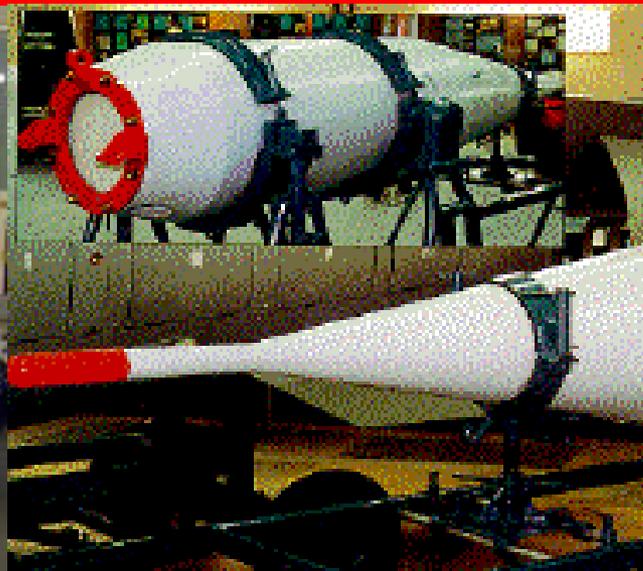




Rocket Sled Facility Arzamas-16 / 2012



Arzamas-16 Museum



First Russian
Tactical Missile
Warhead , 10 Kt



RDS-6c "Layer Cake"

Arzamas-16 Museum



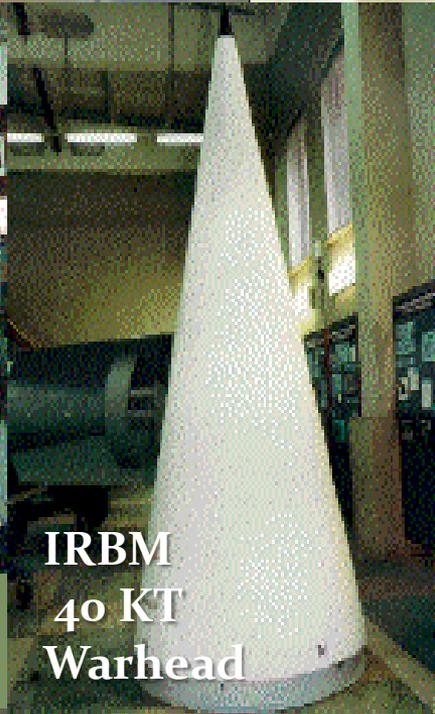
First mass-produced tactical nuclear bomb - "RDS-4"



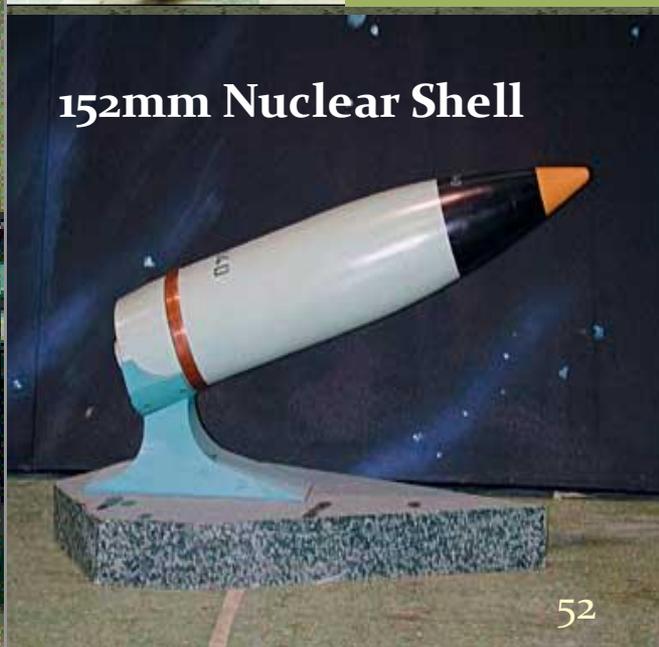
2 MT Warhead



R-7 ICBM Warhead
NATO SS-6 Sapwood



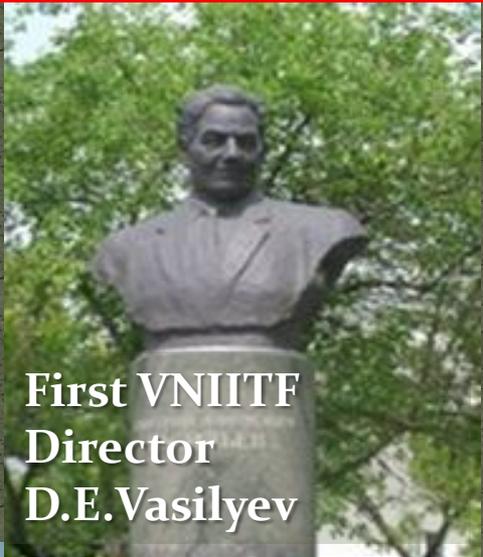
IRBM
40 KT
Warhead



152mm Nuclear Shell

CHELYABINSK-70 VNIITF

ALL-RUSSIAN SCIENTIFIC RESEARCH INSTITUTE OF TECHNICAL PHYSICS



First VNIITF
Director
D.E.Vasilyev



Lenin Square Snezhinsk



Simonenko

- Founded 1955 at Snezhinsk
- Stewardship of the Russian nuclear stockpile and improved efficiency, safety and reliability of nuclear warheads
- Properties of substances in a wide range of pressures and temperatures
- Kinetics of explosives
- Thermonuclear reactions
- Plasma physics
- Turbulent mixing
- Gas dynamics
- Inertial thermonuclear fusion
- Physics of the interaction of laser radiation with matter
- Astrophysics
- Computational mathematical modeling.



Kasli (Касли) CHELYABINSK-70 VNIITF



ALL-RUSSIAN SCIENTIFIC RESEARCH INSTITUTE OF TECHNICAL PHYSICS



Artillery Shell



KASLI ---VNIIEF

ICBM Warhead



1st Russian Mass Produced Strategic Bomb



Surface to Air



1st Russian Mass Produced Hydrogen Bomb



SLBM Warhead



KASLI ---VNIIE TF



Light SLBM Warhead



Sub-Launched Missile Warhead



Warhead for New Missile



Compact Thermonuclear Charge



Nikolai L Dukhov Institute of Automatics VNIIA



All-Russian Research Institute of Automatics



Nikolai L. Dukhov

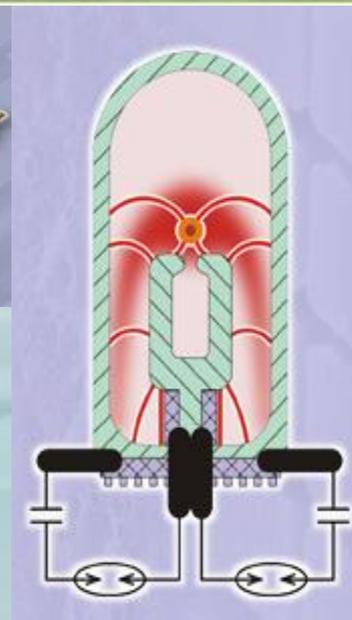
NOVOSKOBODSKAYA SITE



TZARITZYNO SITE

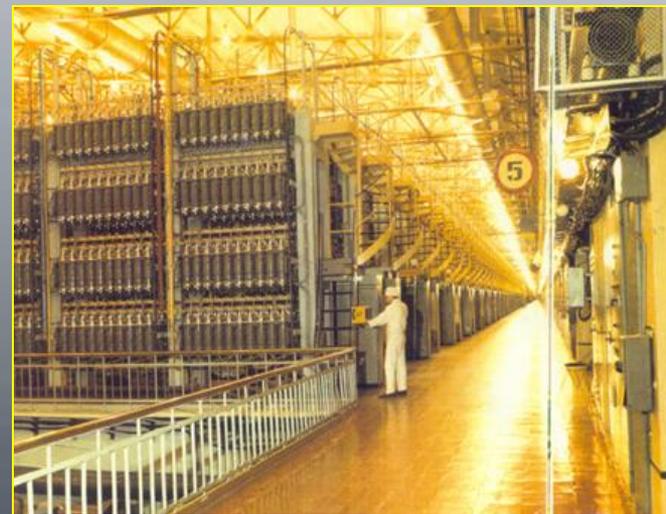


MOSKVORECHIE SITE



История русской ядерной программы

FISSILE MATERIAL PRODUCTION FACILITIES



Yellow
Cake

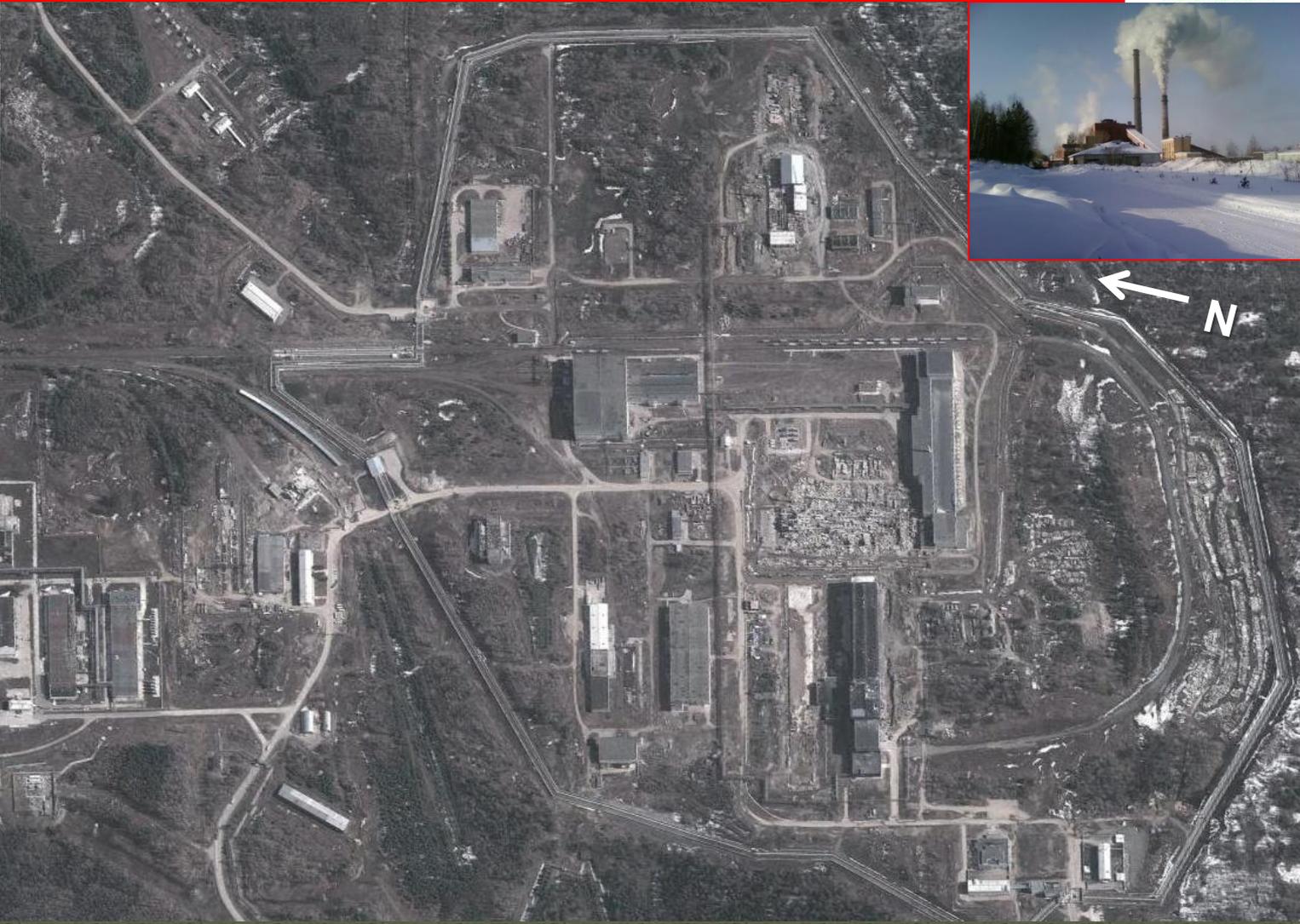


Mayak Plutonium Recovery & Conversion Facility





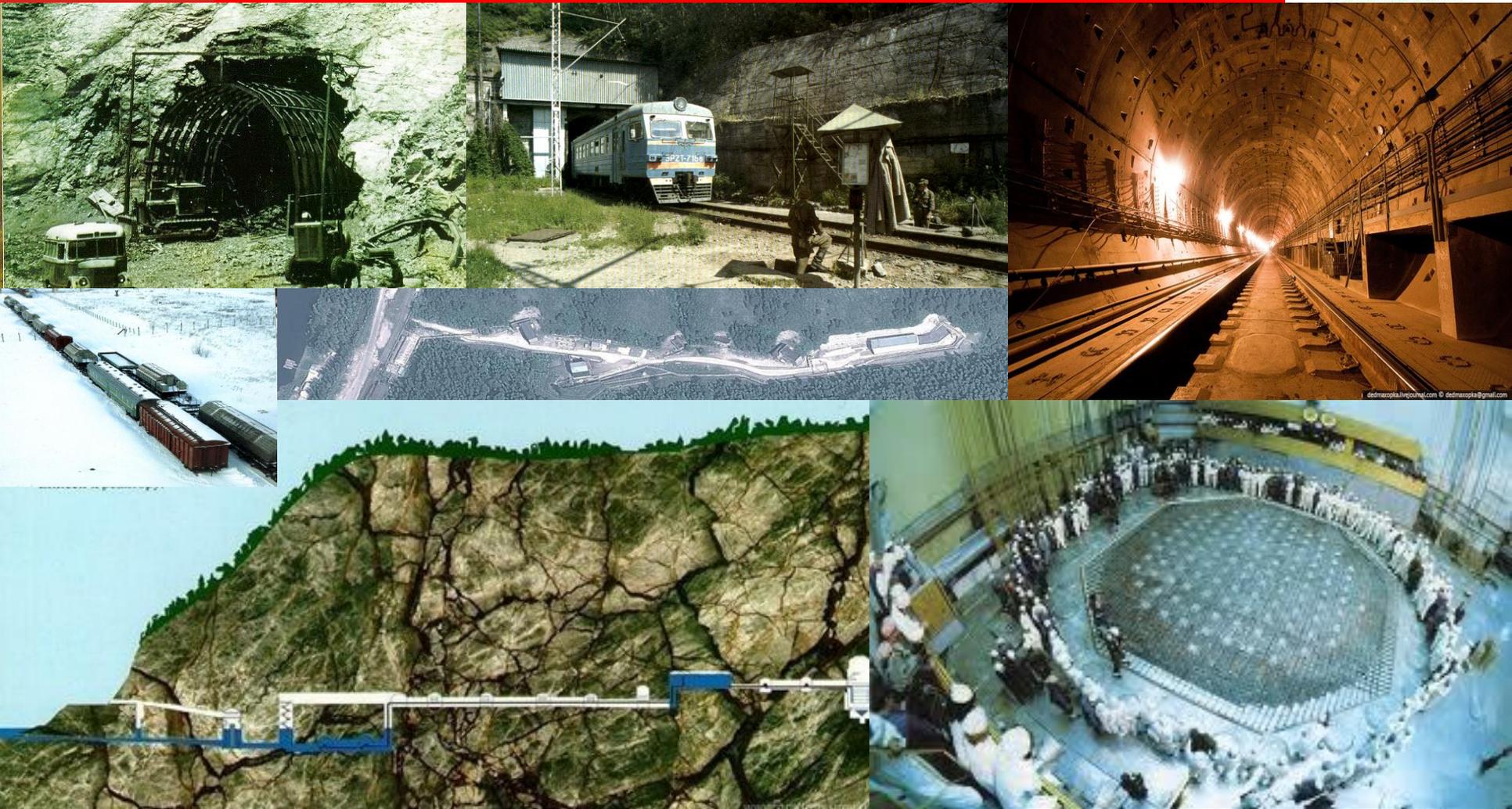
Zheleznogorsk Plutonium Production KRASNOYARSK-26





Zheleznogorsk Plutonium Production

KRASNOYARSK-26 "DODONOVA"





Seversk Plutonium Production TOMSK-7





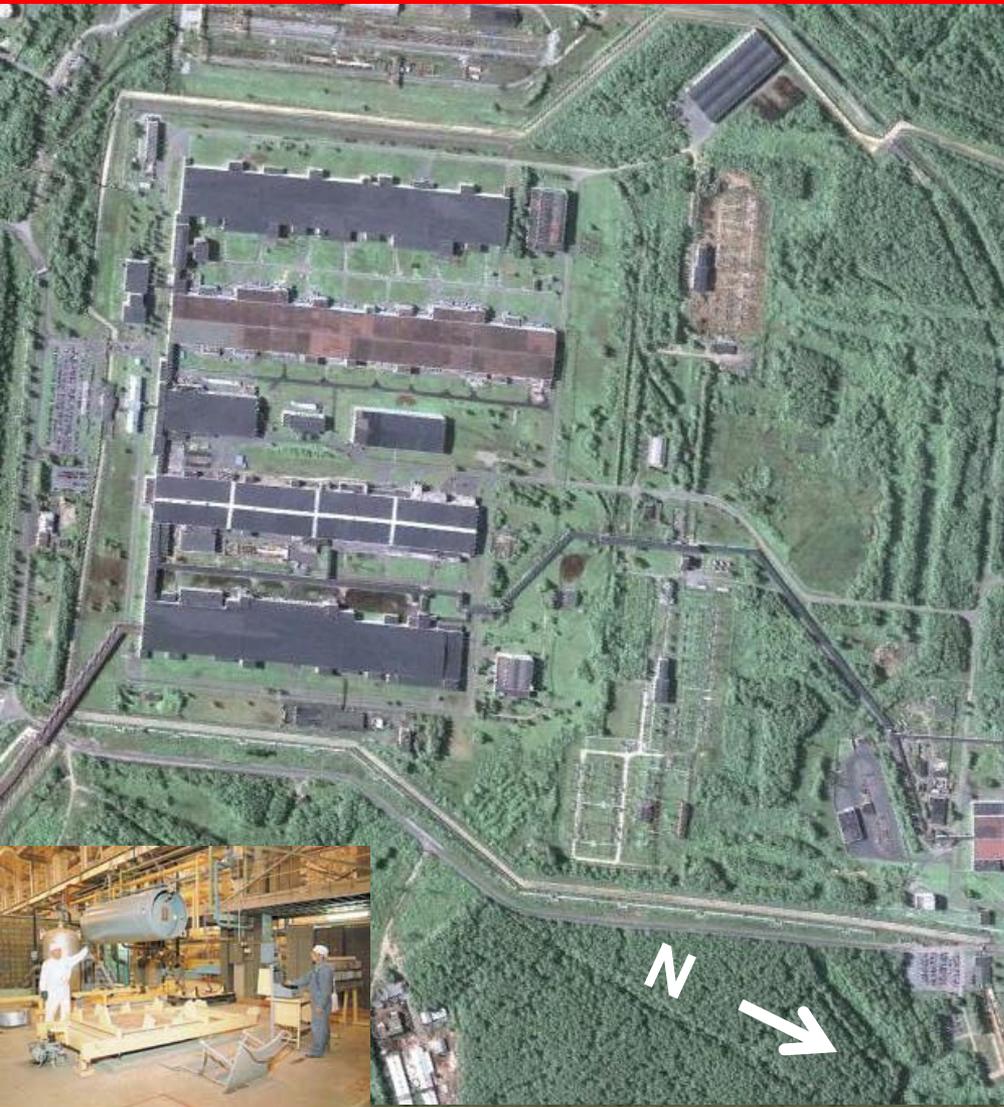
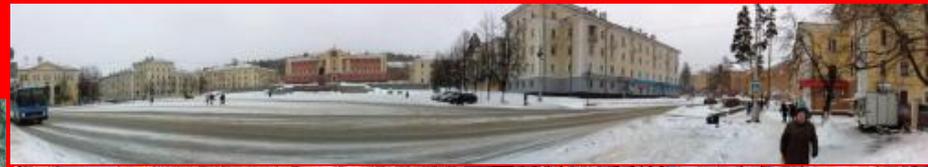
Angarsk Electrolysis Chemical Complex (Uranium Enrichment)





Novoural'sk Uranium Enrichment

SVERDLOVSK-44





Zelenogorsk Uranium Enrichment KRASNOYARSK-45





Seversk Siberian Chemical Combine

TOMSK-7 URANIUM ENRICHMENT



RBMK

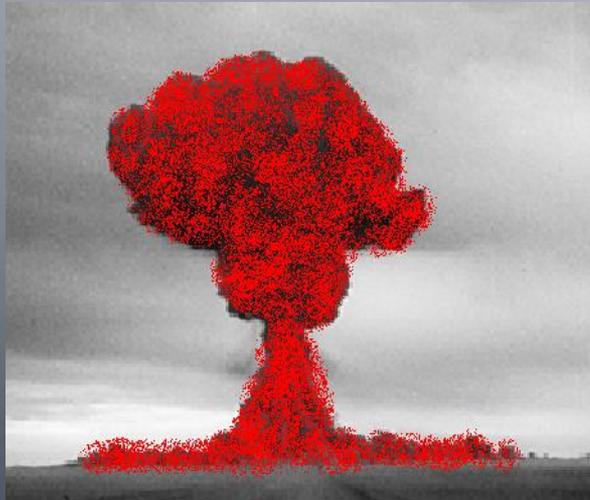
Ancillary Tritium Production from RBMKs



"High Power Channel-type Reactors"



WEAPON PARTS PRODUCTION FACILITIES





Mayak Pit Facility

SECTION OF CHELYABINSK





Arzamas
Avangard
Warhead
Assembly/
Disassembly
Facility

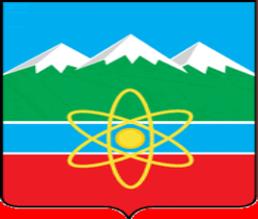


Road to Rail Transfer Point



Kasli (Касли) Area 9 CHELYABINSK-70 VNIITF





Trekhgorny Weapon Parts/Assembly

ZLATOUST-36





Lesnoy Weapon Parts/Assembly SVERDLOVSK-45 Лесной



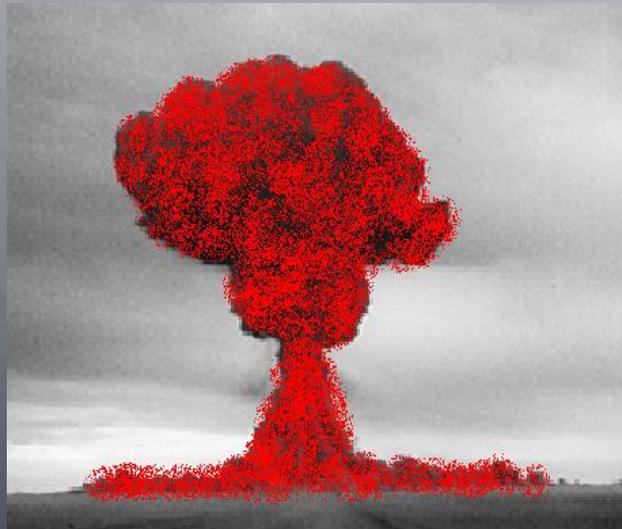


Zarechny Weapon Parts/Assembly (PENZA-19)





RUSSIAN NUCLEAR WEAPONS



Zarechny Nuclear Weapons Museum





















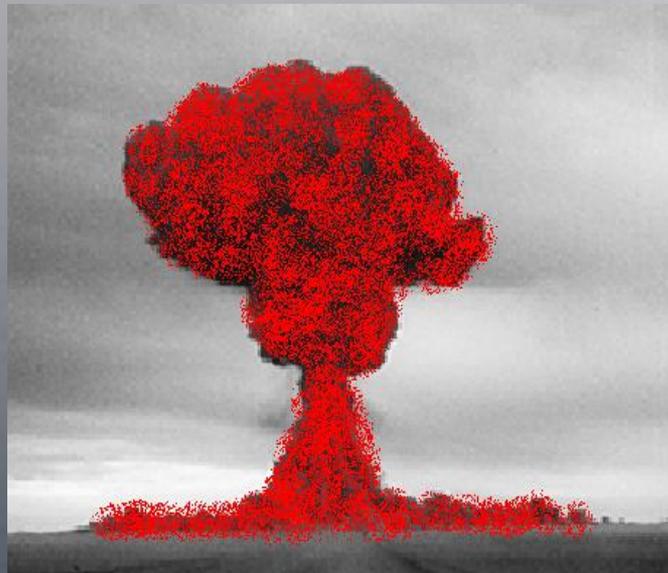
Музей
Информационная справка
47-04



NUCLEAR WEAPON DELIVERY SYSTEMS



R-9 - SS-8
SASIN



Russian Strategic Bombers

Boeing B-29
Super Fortress



Tupolev Tu-4 (NATO
codenamed 'Bull')



TU-95MS Bear



TU-60 Strategic
Bomber

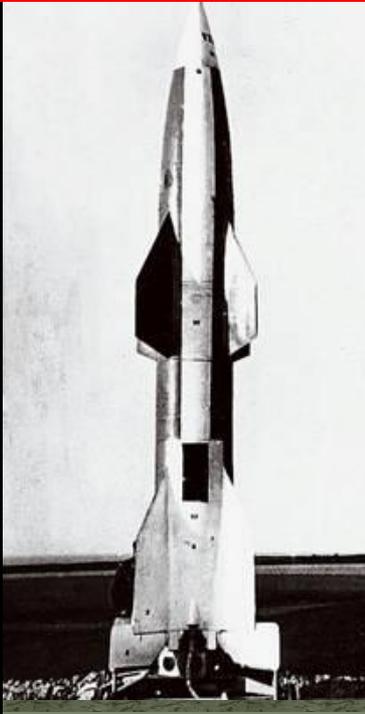


TU-22M3
Strategic Bomber





The Wasser Fall Legacy



Wasser Fall



Scud



No Dong



Ghauri



Shahab

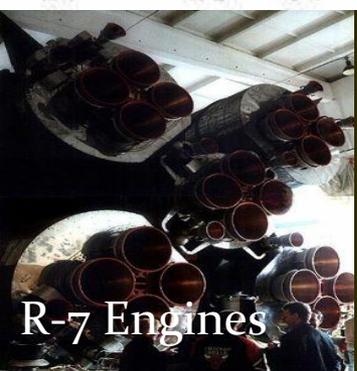
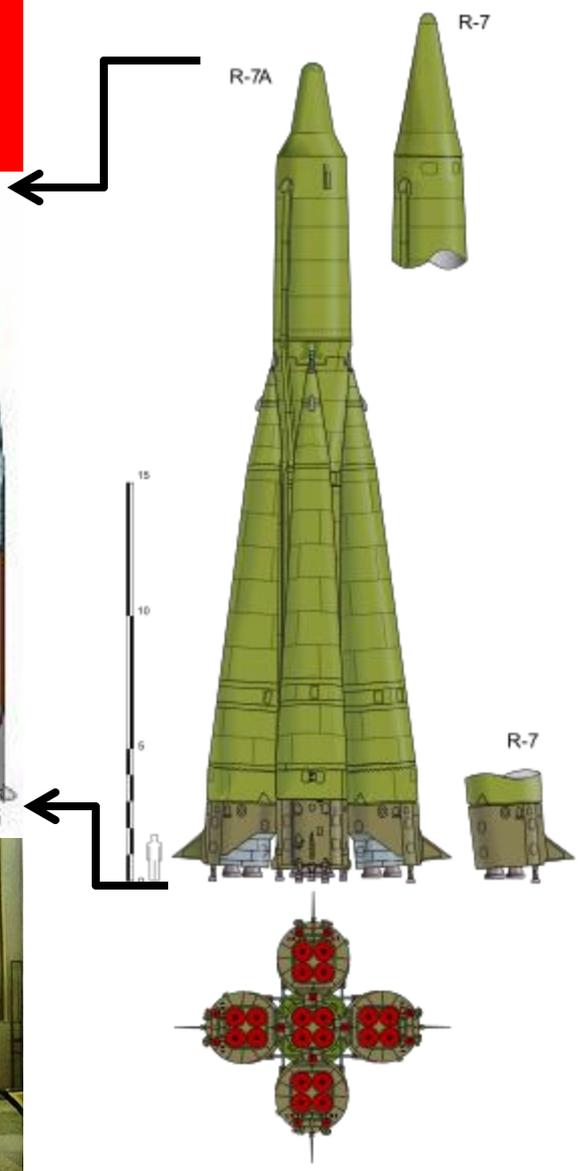
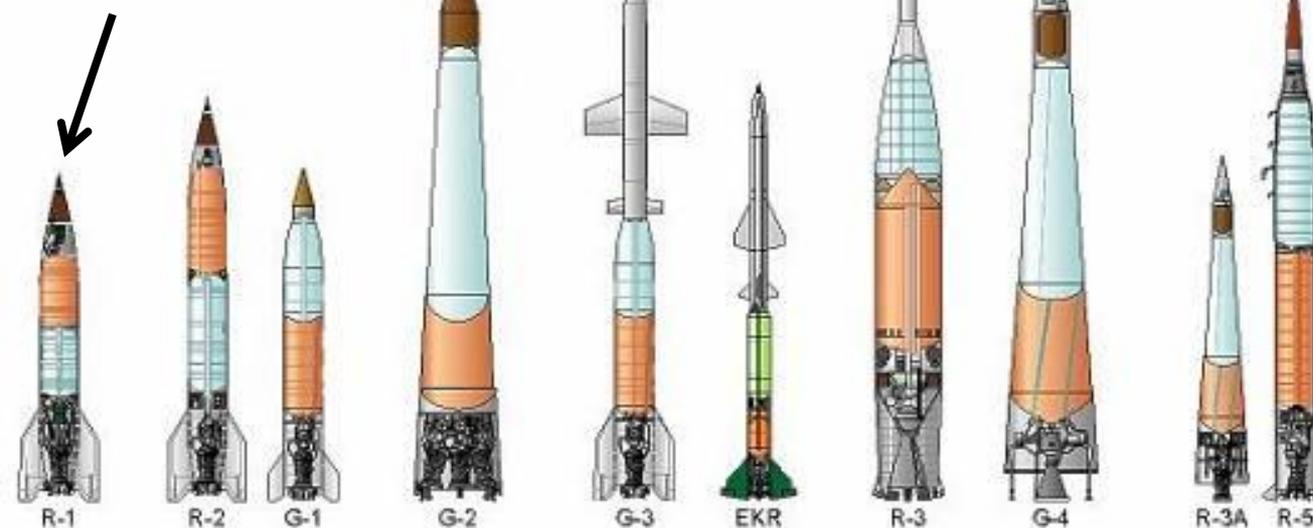
The Wasser Fall was designed as an anti-aircraft weapon and was used several times to destroy Allied bombers amassed in formations. With the fall of the Third Reich, Wasser Fall missiles, parts, production equipment, and the technicians who operated the German production line were relocated to the Soviet Union.

Evolution of Russian Missiles to the R-7

R-7 (SS-6 Sapwood)



V-2 Clone

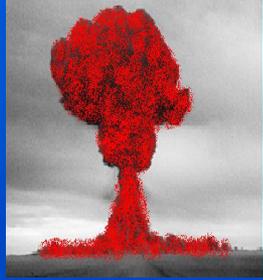


R-7 was in service from 1960 to 1968 from four pads at Plesetsk and one at Baikonur (warhead RDS - 46.5 MT)



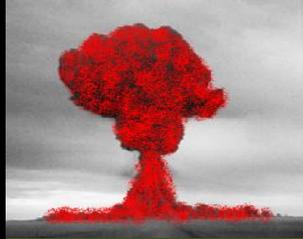
R-7 Warhead

Russian Land Based ICBMs



SS-19
(RS-18,
Stiletto)





R-36M SS-18 SATAN

(8F675 Mod2) 20 MT warhead for R-36M2 / SS-18 Satan ICBM (single)

(8Fo21 2) 5 MT warheads for R-36MP / SS-18 Satan ICBM (3 MIRV warheads)

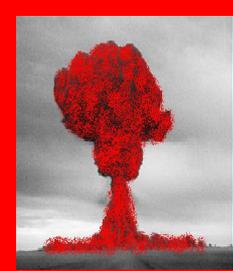
(R-36 MUTTh Mod 4) 550 KT warheads for R-36M2 / SS-18 Satan ICBM (10 MIRV warheads)

(R-36M2 Воевода Mod 5) 10 MIRVed 750 KT warheads)

Russia is developing a new heavy ICBM



Road Mobile Topol Sickle Launch





RT-23 (SS-24 Scalpel)



RT-23 / SS-24 Scalpel ICBMs had 10 MIRV warheads with design yields of 550 KT. The system was extremely heavy, so heavy that it caused extensive rail damage when deployed. This problem likely was one reason the Russians agreed to retire the RT-23 under the SALT agreement.



New Rail Mobile ICBM



Deputy Defense Minister Yury Borisov announced that the Moscow Institute of Thermal Technology (MITT) was developing a new, lighter weight rail-mobile ICBM system, permitted with the end of START. This upgrade eliminates the damage to railroads caused by the RT-23. According to public Russian statements, the nuclear warheads will be of a new design that will be significantly hardened to nuclear effects.



RS-24 Yars (NATO SS-29)



RS-24 Yars (NATO SS-29) is heavier than the Topol-M and can be deployed in both silo and road mobile. Yars could be capable of delivering 10 independently targetable RVs and entered service July 2010.



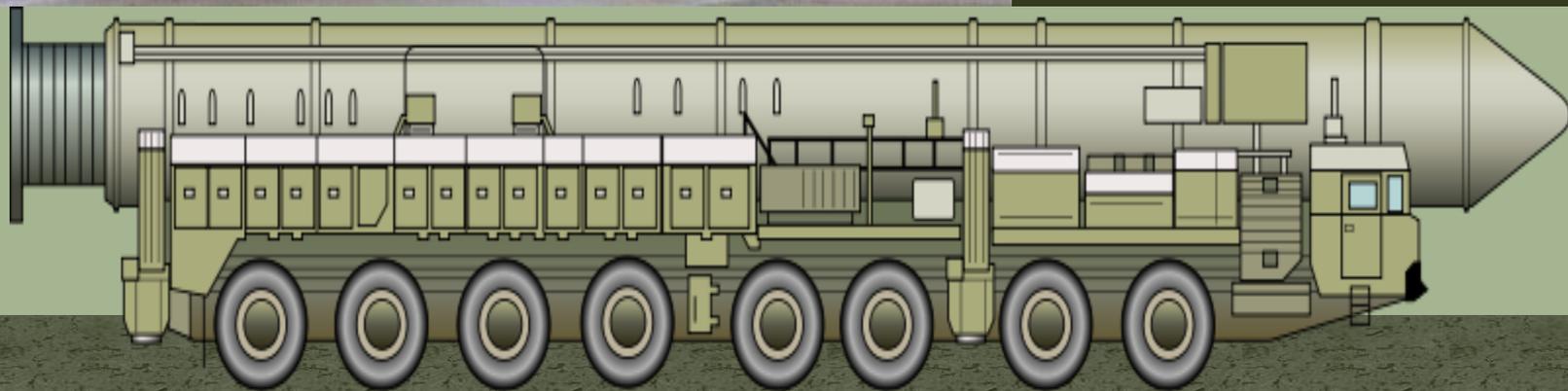
Moscow Institute of Thermal Technology



Road Mobile Topol-M (RS-12 M2) SS27 Sickle B



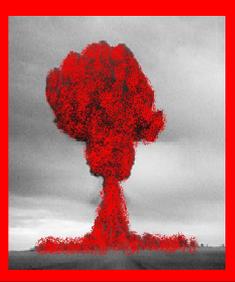
Per Russian Strategic Missile Force Commander, Lt. Gen. Sergei Karakayev, Russia plans to replace its single-warhead mobile RS-12M2 Topol-M intercontinental strategic missile system with a new Topol missile that can carry up to four, independently-targeted, nuclear warheads.



The New Roadmobile

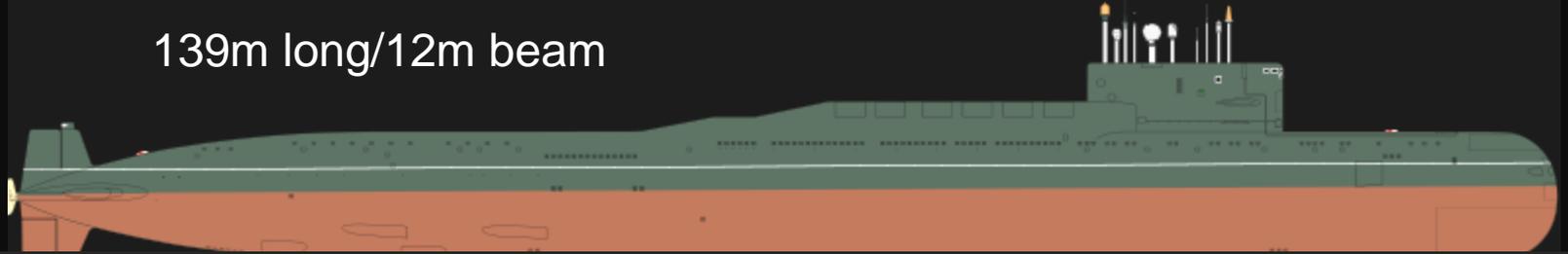
Version of the RS-24 Yars





Delta IV SSBN

139m long/12m beam



Yekaterinburg
Delta IV SSBN





Delta IV SSBN (involved in Murmansk Fire, 29 Dec 2011)



Yekaterinburg Delta IV SSBN in
2011 Murmansk Fire



Project 941

Akula, SS-N-20 Missiles

Typhoon Class SSBN



175m long/23m beam



R-27
SS-N-6



R-29
SS-N-8



R-29R
SS-N-18



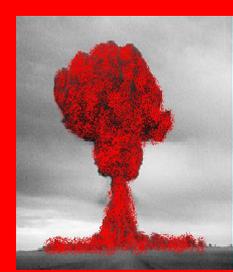
R-29RM
SS-N-23



R-39
SS-N-20



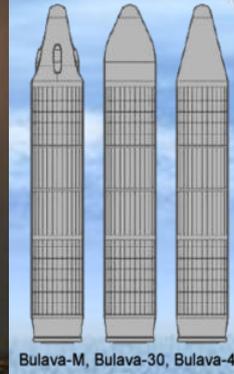
New Borei-Class SSBN and New Bulava SLBMs



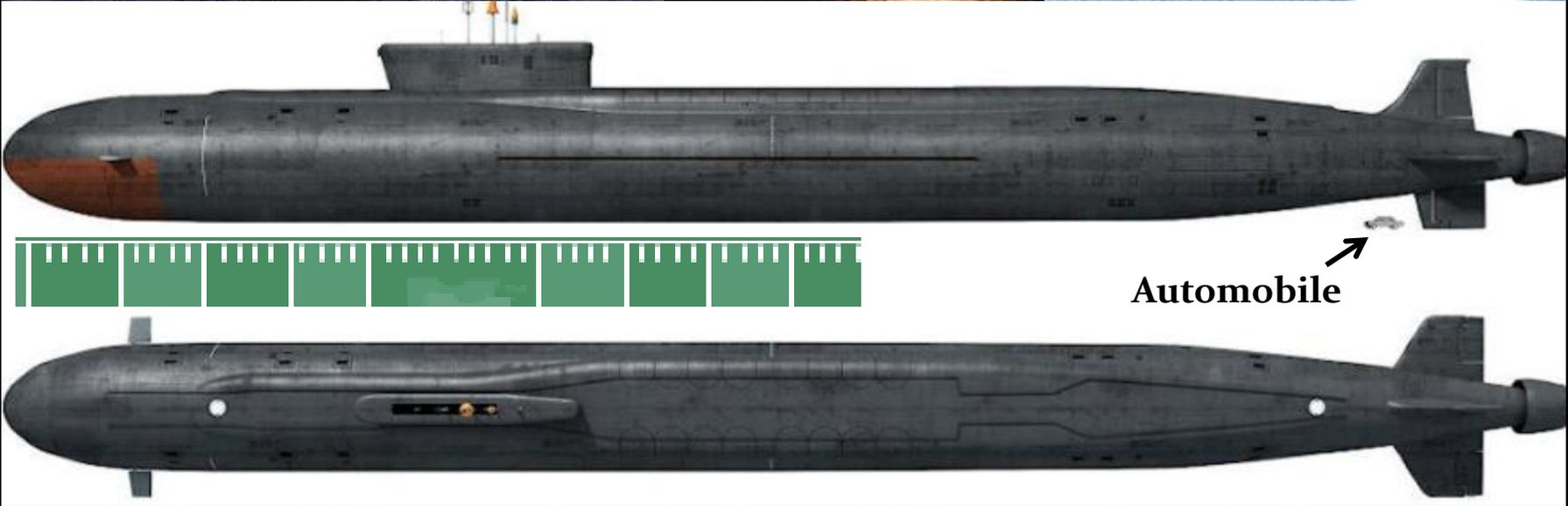
Bulava-30
SLBM



170m long/13.5m beam



Bulava-M, Bulava-30, Bulava-47



2013 Major Russian Strategic Exercises

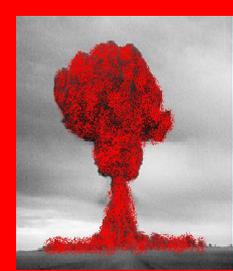


President Putin was personally involved in the exercises



30 October 2013: Exercise included S-300 and S-400 defense systems; launches of 2 ICBMs (**Topol** and **SS-18**); 2 SLBMs; 4 SRBMs (**Islander (1)** and **Tochka-U (3)**); 6 TU-95M and 2 TU-160 flights to Venezuela.

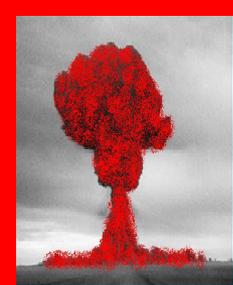
Reemergence of Confrontational Strategies



2008 F-22 tracks resume to test and evaluated US defense posture and capabilities



2009 Russian nuclear submarine patrols off US coasts resume (Sierra-2)



TO CLOSE: RUSSIA VALUES ITS NUCLEAR WEAPON PROGRAM AND IS CONTINUING MAJOR NUCLEAR FORCE IMPROVEMENTS

- The Russian nuclear weapons complex has downsized while modernizing within a smaller and more efficient footprint.
- Emphasis is being placed on modernizing Russian nuclear warheads, missiles, and serial production capacities.
- Significant year-around experimentation with very large parks of instrumentation vans is constantly occurred at the Novaya Zemlya UGT Site.
- In late 2012, Russia ended the Nunn-Lugar program that had focused on safeguarding SNM and converting it to peaceful use.
- The majority of funds in the 'Russian' defense program up through 2015 will be spent on modernizing Russian strategic nuclear forces.*

*Russian Deputy Defense Minister A. Moltensky

