"thick" snorkel. This vehicle, which has a large spade for greater efficiency in its recovery missions, has the lower part of the snorkel permanently attached while the upper portion is carried on the rear of the vehicle. The new K-61 self-propelled ferry for medium armor was also sighted more frequently during the year. It uses two modified K-61 tracked amphibians and two special pontons.

Except for the new tank recovery vehicle, no new armored vehicles were sighted during 1960. Modifications have been made on the rear of the T-10 heavy tank turret, but their exact nature has not been established. There have also been reports of overhead armor on both the BTR-50p and BTR-152 armored personnel carriers.

In the conventional artillery field the only report of a new item concerned the unconfirmed sighting of an auxiliary-propelled version of the 100mm field gun. Although the weapon has previously been reported in the USSR, this is the first reported sighting in the GSFG.

In the automotive field the general trend toward introduction of various types of tractor truck-semitrailer combinations has continued with the 4x2 GAZ-51p being confirmed during 1960.

c. East Germany

The East German Army is still the only Soviet Bloc force outside the Soviet Union in which issue of the 57mm auxiliary-propelled antitank gun has been confirmed.

The only new item in this army is the light diesel-powered 1.8-metric-ton 4x4 truck, the Robur LD 1800A, which has been adopted as standard, replacing the present Robur Garant 30K. It will go into production during the first half of 1961. The LD 1800A has improved towing power and cross-country mobility.

d. Poland

It has been confirmed that the new Polish 4-metric-ton 6x6 military truck is called the Star-66. The Star-66 is the only all-wheel drive Polish truck.

e. Czechoslovakia

Czechoslovakia introduced a variety of new equipment during 1960 with most of the items being displayed for the first time in the 9 May 1960 parade in Prague. The new Czech version of the Soviet Kalashnikov (AK) submachine gun has been confirmed as the M-58. It is replacing all older Czech submachine guns and rifles. The M-52/57 light machine gun remains standard. The infantry has also received a new 82mm recoilless gun with a spotting rifle. Its characteristics have not been established, but it definitely has a greater effective antiarmor range than the older T-21 (Tarasnice). It is the first Soviet Bloc gun with a spotting rifle.

In the armor field the Czechs introduced a new armored twin 30mm automatic antiaircraft gun. It is mounted on a wheeled 6x6 chassis. probably that of the standard Praga V3S truck. Another new item of armor is a modified Soviet-type BTR-50p amphibious tracked armored personnel carrier with overhead armor. This is the first Soviet-type armored personnel carrier to be reported in Czech hands. It may be produced in Czechoslovakia. German World War II-type half-track armored personnel carriers (SdKfz 251) have also been seen with full overhead armor. However, it is believed that these latter vehicles are merely modifications and not current production models.

Czech attention to river-crossing problems in mobile operations was also evidenced by the display of new scissors-type assault bridges mounted on turretless T-34 tank chassis. This is the first bridge of the scissors-type confirmed in the Soviet Bloc, although the development of a similar item is going on in East Germany.

2. (C) Expected Developments in 1961

a. USSR

Various new Soviet armored vehicles will probably be identified during 1961. Confirmation is expected of the BTR-50p armored personnel carrier with overhead armor in the hands of the

troops as is the identification of new self-propelled artillery (assault guns or antiaircraft tanks) using the modified PT chassis.

In the small arms field the phasing-out of the Goryunov machine gun in favor of improved versions of the RP-46 company machine gun may occur. In addition a new light machine gun for squad use may be positively identified.

Several new trucks will probably go into production during 1961. They are the 1.5-metric-ton GAZ-56 (4x2), the 2-metric-ton GAZ-66 (4x4), the 2.5-metric-ton GAZ-52 (4x2), the 7-metric-ton MAZ-500 (4x2) and the 7-metric-ton Ural ZIS-375 (6x6). The vehicles with all-wheel drive are of special military significance.

b. GSFG

Some of the new Soviet armored vehicles mentioned above will probably appear in the GSFG during 1961. In addition a substantial number of armored personnel carriers with full overhead cover should be seen. The GAZ-62 light truck, and possibly some of the other new trucks, will make their appearance. More extensive use of all versions of the YaAZ-210 and YaAZ-214 trucks will be observed.

c. East Germany

The new LD 1800A light truck will go into production in 1961 and will rapidly be integrated into the East German Army. The civilian version, the LD 2500, will also be in production by that time. The most recent version of the 5-metric-ton 6x6 truck, the G 5, will also be standardized and produced. It is called the G 5/3. Work will continue on the P3 jeep project as well as the light wheeled prime mover, the "Bornim," the design of which is based on the West German Unimog. It may be developed into a new light 1-metric-ton truck. Although these vehicles may be standardized in 1961, their production will probably take place in 1962 or later.

GUIDED MISSILE CAPABILITIES

1. (S) General

a. Soviet capabilities in the field of guided missiles continued to increase during the past year. The Soviets have introduced a surface-to-air missile (SAM) system into three Soviet Bloc countries. In East Germany there are now five confirmed sites at Glau, Jueterbog Damm, Rauen, Klosterfelde and Proetzel. One site has been noted near Durres, Albania, and three have been located on the periphery of Sofia, Bulgaria.

b. It also became apparent in 1960 that at least eight SAM sites and two support facilities were being constructed in a ring around Berlin. Rauen, Klosterfelde and Proetzel are three of the eight sites. These sites should become operational in the summer of 1961. Available information indicates that East German Army (EGA) troops will man these sites when completed, although the Soviets will probably retain operational control.

c. Although no surface-to-surface missile (SSM) units or sites have been confirmed in East Germany, it is probable that Soviet units are being equipped with members of the 15-to 30-nautical-mile "free rocket over ground" family (Frog 1, 2, 3 and 4) and the 100-nautical-mile SS-1 Scud. It is possible that the 700-nautical-mile SS-4 Shyster has been introduced into the Group of Soviet Forces, Germany (GSFG) and integrated into general headquarters reserve artillery. Weapons of this type are possibly stored near Gross Doelln.

d. The number of sightings of special fuel and liquid oxygen (lox) rail cars has decreased during 1960, possibly because sufficient stocks are now on hand. There have been numerous reports of lox trucks in East Germany. It is anticipated that more sightings will be noted during the coming year because of the estimated increase in numbers of lox-serviced missiles.

e. Mock-ups of the US Corporal, Matador, Redstone and Nike missiles continue to be reported in East Germany. These mock-ups play an important role as training aids for Soviet Bloc photo interpreter personnel and as a training media for "commando-type" forces especially trained for sabotage of US missile sites. It is expected that more of these sightings will be reported during the coming year.

f. Intercepts of Spoon Rest radars have increased in the last year, indicating a larger number of these radars are present in East Germany. In the past they have operated sporadically, but during the last quarter of 1960 have operated for 24 hours a day at times. Fruit Set radars have also increased in operational activity in consonance with the increased number of SAM sites in East Germany. With the completion of the SAM ring around Berlin more intercepts of these radars can be expected.

2. (S) Estimate of Soviet Guided Missiles

a. It is estimated that the Soviets have the capability of employing operational SSM as follows:

Reference Designation	Operational Capability Date	Range(NM)*	Guidance	Remarks
Frog-1	1954	15	Free rocket	For tactical support of ground forces. Carried on full-tracked chassis
Frog-2	1954	35	Free rocket	For tactical support of ground forces. Carried on full-tracked armored chassis
Frog-3	1957	20-30	Free rocket	For tactical support of ground forces. Carried on full-tracked armored chassis

* nautical miles

Reference Designation	Operational Capability Date	Range(NM)	Guidance	Remarks
Frog-4	1957	20-30	Free rocket	For tactical support of ground forces. Carried on full-tracked armored chassis
SS-1 (Scud)	1954-57	75-100	Radar track-radio command or all inertial	Launched from self-propelled tracked vehicle. For tactical support of ground forces
SS-2	1954	150-200	All inertial	Outgrowth of V-2. Road mobile
SS-3	1954	350	All inertial	Outgrowth of V-2. Road mobile
SS-4 (Shyster)	1956	700	All inertial	Road mobile. Can be employed both in a tactical or strategic role
SS-5 (IRBM)	Late 1958 or early 1959	1,100	Radio-inertial or all inertial	Road or rail mobile
SS-6 (ICBM)	1960	5,500	1961-63 All inertial	Could be rail mobile or located at a fixed installation. Strategic missile, capable of intercontinental attack. Limited availability

(1) The weapons listed with ranges up through 1,100 nautical miles are believed to be in series production and in the hands of Soviet troops. It is estimated that these weapons have the necessary range, accuracy and reliability to be employed in a Soviet attack against targets in Western Europe.

(2) In the Moscow parade on 7 November 1960 the Soviets displayed a new-type SSM which is very similar to the SS-4 Shyster 700-nautical-mile missile. Sufficient analysis of this missile has not yet been made to determine its range and capability. However, preliminary investigation shows that it is approximately three feet longer than the SS-4 Shyster and is slightly larger in diameter and has a flared base, indicating an increased engine thrust. Because of the additional weight it is currently estimated that this missile may have a slightly shorter range capability than the SS-4 Shyster. These modifications point to the use of a more easily stored oxidizer, thereby reducing logistic and handling problems.

b. Cruise-type SSM

After World War II the Soviets applied German knowledge to a cruise missile of the V-1 type. This type of aerodynamic missile system was probably operational as early as 1948. According to US thinking this type of system is obsolete. The Soviets have probably continued the cruise missile program and now have, or could have, the following:

Surface-to-surface Cruise-type Missiles with Estimated Characteristics

Year Operational	Missile Type	Range(NM)	Guidance	Remarks
1955	V-1 subsonic	200	Radar track	In tactical use
1957	V-1 supersonic	500	Hyperbolic navigation	Used against peripheral area installations, personnel concentrations and ships

Year Operational	Missile Type	Range(NM)	Guidance	Remarks
1961	V-1 super-sonic	2,000-5,000	Inertial mid-course with fix-taking correction	Used possibly for back-up of ICBM or reconnaissance missions

c. Soviet SAM

(1) The Soviet SAM program has been steadily progressing and expanding. The Moscow SA-1 SAM complex, discovered in 1953, was the first attempt by the Soviets to meet the massed-raid bombing threat with an effective air defense. Elaborate sites and support facilities were completed around Moscow and apparently started at several other cities. However, construction was halted before missiles were emplaced, possibly because the static SA-1 defenses were too costly and the development of the new SA-2 (Glau-type) system gave a more versatile, mobile and economical system. The SA-2 system now has appeared in numerous cities in the USSR and in three of the Soviet Bloc countries. The Soviets are rapidly building an effective air defense barrier around large cities and around small, strategically important fixed facilities. They are also adapting the SA-2 system to the protection of Soviet field forces.

It is anticipated that numerous additional SA-2 sites will be identified during 1961 in the Soviet Union and all of the Soviet Bloc countries.

(2) The sites that are now being constructed around Berlin will have a temporary appearance initially but probably will be converted to permanent installations at a later date.

(3) Further substantiation of the construction of a ring around Berlin appeared in the recent sighting of approximately 30 sheeted Guideline (SA-2) trailers parked inside the Ladeburg support facility. It is believed this equipment will eventually be deployed to the eight sites which are being constructed to encircle the city.

(4) Estimated Characteristics of Soviet Surface-to-Air Missiles

Reference Designation	Operational Capability Date	Max Horizontal Range (NM)	Effective Altitude(ft) Limits	Guidance	Remarks
SA-1 (V-301)	1955	16-25	3,000 to 60,000	Radar track with radio command	Single-stage liquid propellant missile deployed in sites around Moscow. Each site gives 54° coverage
SA-2 (Guide-line)	1957	25-40	4,000 to 60,000	Radar track with radio command	Solid propellant booster, liquid propellant sustainer. Deployed in Soviet Bloc in both mobile and static defense. Gives 360° coverage
SA-3	1961	10 (low) and 25 (medium)	50 to 40,000	Semi-active radar homing	Static or mobile low-altitude defense
SA-4	1961	Around 100	90,000	Command with active terminal homing	This high altitude defense system could employ SA-2 components as a step toward an antiballistic missile system
SA-5 Anti-missile-missile (AMM)	1963-1966	50-75	300,000 to 500,000	Command	Anti-missile-missile system for static USSR defense

3. Estimate of the Soviet 1960 Missile Program

a. It is estimated that the Soviet missile program will continue to have a top priority in the USSR in the research and development, and in the operational phases. It is also estimated that within the next 12 months more surface-to-air missile sites will be seen in both the USSR and the Soviet Bloc countries and that these sites will be of the mobile or semimobile concept as opposed to the existing fixed complex around Moscow.

b. Shyster SS-4 missiles are probably present in East Germany at this time. Confirmation of the 100-nautical-mile Scud SS-1 and the 700-nautical-mile Shyster missile in East Germany should be made in 1961, and the introduction of the SS-2 and SS-3 into East Germany can be anticipated.

ATOMIC ENERGY CAPABILITIES

1. (S) USSR

a. Weapons

It is estimated that the USSR has a complete family of nuclear weapon systems available to support its ground operations. Soviet doctrine and training provide for nuclear fire support. As more fissionable material becomes available it is expected that the weapons' stockpile will become more diversified.

Assuming that the priority requirements for high-yield long-range weapons have been met, it is expected that in the future a relatively large percentage of fissionable material will be allocated to the production of low-yield tactical ground support and air defense weapons.

b. Testing

During 1960 the USSR has continued negotiations on a nuclear test ban and has apparently refrained from detonating any detectable nuclear devices. The USSR has the capability of performing deep underground nuclear tests which the free world has only a marginal capability to detect. However, it is estimated that as long as the nuclear test ban discussions continue and there is no resumption of testing by other conference participants, the USSR will not overtly resume its test program.

Although it is considered unlikely, it is possible that as early as 1961 the USSR may use one of the other Sino-Soviet Bloc members to evade a test moratorium. This might be done by employing Communist China as a proving ground and attempting to make it appear to the outside world that devices tested were actually Chinese-developed.

c. Presence of Nuclear Weapons Outside of the USSR

The Group of Soviet Forces, Germany (GSFG) now has available a number of ground and air delivery systems as indicated in the remarks column of paragraph "d" below. It is considered highly probable that the Soviets will exploit fully the capabilities of these delivery vehicles through the positioning of nuclear components within a reasonable distance of the user unit. Although the deployment of nuclear weapons outside the USSR has not as yet been determined, the Soviets have the capability of deploying these in the Satellites without detection. Political ramifications might deter such Soviet action. The Soviets do, however, have an extremely well-developed network of airfields in the Satellites. A great number of these fields can easily handle large transport aircraft. This airfield system could be used for delivery of nuclear components to user units just before an attack.

d. Delivery Systems

(1) Tube Artillery and Free Rockets

Weapons System	Projectile or Warhead Weight (Pounds)	Range (Yards)	Remarks
200mm 4-round rocket launcher BMD-20	420	20,200	In GSFG
203mm gun howitzer M-1955	Approximately 300	32,000	Possibly in GSFG
240mm mortar M-240	Approximately 300	10,600	Probably departed GSFG
280mm (?) 6-round rocket launcher	1,000	25,000-30,000	Possibly in GSFG
310mm self-propelled gun	500	25,000	Not in GSFG
400mm self-propelled mortar	500	23,000	Not in GSFG

Weapons System	Projectile or Warhead Weight (Pounds)	Range (Yards)	Remarks
Frog* 1 (1-round rocket launcher on JS chassis)	1,500	70,000	No firm evidence of presence in GSFG
Frog 2 (1-round rocket launcher on PT chassis)	1,000	30,000	No firm evidence of presence in GSFG
Frog 3 (1-round rocket launcher on PT chassis)	1,000	40,000-50,000	No firm evidence of presence in GSFG
Frog 4 (1-round rocket launcher on PT chassis)	800	40,000-50,000	No firm evidence of presence in GSFG

*Free rocket over ground

(2) Guided Missiles

Missile	Range (Nautical Miles)	Warhead Weight (Pounds)	Remarks
SS-1	75-100 (Scud)	1,500	Probably in GSFG
SS-2	150-200	2,000	Not in GSFG
SS-3	350	2,000	Not in GSFG
SS-4	700 (Shyster)	3,000	Possibly in GSFG
SS-5	1,100	3,000	Not in GSFG
SS-6	5,500	6,000	Not in GSFG

Missile	Range (Nautical Miles)	Warhead Weight (Pounds)	Remarks
SA-1	16-25	450-700	Not in GSFG
SA-2	25-40	450-700	In GSFG
SA-3	10-25	150-250	Not in GSFG

(3) Air Delivery

Aircraft	Type	Bomb Load (Pounds)	Combat Radius (Nautical Miles)	Remarks
Bear	Heavy turbo-prop bomber	10,000-20,000	3,900	Not in East Germany
Bison	Heavy jet bomber	10,000-20,000	2,750	Not in East Germany
Badger (TU-16)	Medium jet bomber	10,000	1,500	Not in East Germany
Bull (TU-4)	Medium piston bomber	10,000	1,700	Not in East Germany
Beagle (IL-23)	Light jet bomber	4,000	615	In East Germany
Fishbed	Jet fighter-bomber	1,100	450	In East Germany
Farmer (MIG-19)	Jet fighter-bomber	1,100	500	In East Germany
Fresco (MIG-17)	Jet fighter-bomber	1,100	565	In East Germany
Fagot (MIG-15)	Jet fighter-bomber	1,100	366	In East Germany

e. Nuclear Propulsion

The Lenin icebreaker continues to be the only nuclear-propelled vehicle definitely established as operational. Khrushchev has recently announced that the USSR has nuclear powered

submarines. This claim remains to be confirmed. It is estimated that the Soviets are also working on nuclear propulsion for land trains, aircraft and space vehicles.

2. (S) Satellites

a. General

(1) Among the Satellites East Germany and Czechoslovakia have the industrial base required to support a moderate atomic energy effort. In theory these Satellites, because they do possess the resources and technical know-how, could, with Soviet assistance, produce a nominal number of nuclear weapons from the plutonium coming from their power reactors. However, this development is considered improbable in the foreseeable future. A more likely possibility is that the Soviets may, at the proper political moment, establish a so-called Warsaw Pact nuclear weapons pool. If this occurs it will be for propaganda reasons and not for military purposes. Weapons consigned to such a stockpile, although ostensibly for the use of all Pact members, would actually be under Soviet control. In the event of hostilities, nuclear fire support for ground operations would come from Soviet delivery units.

(2) All of the Satellites except Albania are making a contribution to the Soviet atomic energy program, largely through the supply of uranium. In order of present importance to the Soviet atomic energy effort, the Satellites are rated as follows: East Germany, Czechoslovakia, Hungary, Rumania and Bulgaria.

b. East Germany

(1) The construction of the first nuclear power plant located at Gross Stechlinsee is continuing but is now definitely behind schedule. Originally planned to be completed in late 1961, the project has suffered from delays in delivery of equipment and will probably not be ready until the end of 1962 or early 1963. The reactor will be furnished by the USSR and have an output of 70,000 kilowatts (KW). The East Germans are engaged in the design of a second 70,000 KW reactor, construction of which is tentatively programmed to start in the 1963-64 time frame. The location for this reactor may also be the Gross Stechlinsee site. Spent uranium fuel elements coming from these reactors will be returned to the USSR for regeneration and the plutonium so obtained retained by the Soviets.

(2) The East German uranium exploitation effort, already the most important among all of the Satellites, has further expanded. Investment in this project in terms of manpower and plant capacity indicates uranium deposits are large enough to warrant maintaining this activity for a number of years.

The new uranium concentration plant at Seelingstaedt is about to start operating. When working at full capacity, this installation will probably be the largest of its kind in the world. The plant is the first in the Bloc outside of the USSR to use an ion exchange process. This method will permit the production of a high percent uranium oxide concentrate, considerably simplifying the reduction to uranium metal in the USSR.

Although no firm evidence is available, it is estimated the Soviets will eventually convert the large uranium concentration plant at Crossen to the more efficient ion exchange process. Other plants such as Lengenfeld, Freital and Gittersee, whose return on investment is marginal at the best, will either be converted to the new system or phased out. The latter is more likely.

(3) In other aspects of atomic energy in East Germany the following events are anticipated for 1961. Separation of fission products, perhaps to include plutonium, will be studied at the VEB Physikalische Werkstaetten, an institute of the Ministry of Defense, located at Rahnsdorf near Berlin.

Professor Max Steenbeck's Institute for Magnetics and Hydromechanics in Jena may start working during 1961 on ultra-centrifuges for isotope separation.

The Institute of Physical Chemistry in East Berlin, which is headed by Professor Peter Thiessen, will play a more active role in atomic energy developments. The program of this installation has not yet been determined.

The Central Nuclear Research Institute located at Rossendorf, and housing East Germany's first research reactor, will be expanded. The scientific potential of this establishment has been enhanced through the assignment of Doctor Klaus Fuchs to the staff.

Work on the development of an efficient method for heavy water production will continue at the Institute for Materials Separation in Leipzig. Construction of a pilot plant, using the process developed at the Leipzig installation, will probably be started at the Leuna chemical works in 1962.

Although there has been considerable discussion among East German nuclear specialists about the production of uranium metal, the only work being done is on a laboratory scale at the Institute for Pure Materials in Dresden. Large volume production of this item in East Germany in the near future is not considered likely.

(3) Czechoslovakia

(a) Among the Satellites, Czechoslovakia is second only to East Germany as the largest contributor of uranium to the Soviet program. The effort has definitely shifted to the eastern part of the country because of the depletion of deposits in the Jachymov area. A new uranium concentration plant may now be operative in the new area.

(b) The 150,000 KW nuclear power plant being constructed near Bohunice has been delayed. It was originally scheduled for completion in 1962 but will not be completed until 1963-64. As in the case of the East German power reactor, spent fuel elements will be returned to the USSR for plutonium recovery.

(c) The Czech atomic energy program, aside from the projects described above, is relatively modest. However, the availability of industrial capacity to produce reactor equipment and moderating materials should result in considerable expansion in the next few years.

(4) Hungary

(a) This Satellite has large deposits of uranium ore available. The only processing installation known to be in operation is located in the Pecs area. Exploitation of these deposits will probably be expanded, with the entire output going to the USSR.

(b) Other atomic energy activity is limited to general research at two principal centers, the Central Physics Research Institute located near Budapest and the Nuclear Research Institute in Debrecen. The facility near Budapest houses the only reactor available in Hungary, a 2,000 KW research type supplied by the USSR. The nuclear program will continue to be hampered by the lack of nuclear specialists, and expansion will be dependent upon aid from the USSR, East Germany and other Satellites such as Czechoslovakia.

(5) Other Satellites

(a) Among the other Satellites, Poland has the most ambitious program. Although plans for nuclear power and propulsion development have been mentioned, the shortage of uranium will not permit execution of the plans without outside assistance. Uranium deposits are probably so near depletion that the Soviets are allowing the Poles to retain what remains.

(b) Bulgaria and Rumania each have 2,000 KW research reactors identical to those supplied by the USSR to the other Satellites. Extensive deposits of uranium are available, all of which are shipped to the USSR. Very limited research is in progress and only Rumania has the technical potential for expansion in the future. Both nations lack the technical personnel, equipment and industrial support required for large-scale nuclear programs.

CBR CAPABILITIES

1. (S) USSR

a. General

(1) It is estimated that the USSR is well prepared militarily and industrially to engage in and support large-scale offensive chemical warfare (CW). The USSR has a high degree of CW defensive preparedness as evidenced by the widespread issue of protective material and extensive training in its use.

(2) The USSR has the technical capability of producing and stockpiling biological warfare (BW) agents and may have a BW offensive capability. Soviet defensive capabilities against BW agents are considered good against antipersonnel and antianimal agents but poor against anticrop agents.

(3) At the present time the USSR has a defensive radiological warfare (RW) capability only. However, a limited offensive RW research and development program is believed to be under way.

(4) The USSR has the capability of disseminating toxic chemical agents by means of artillery and mortar shells, rockets, mines, bombs, aerial spray tanks and bomblet clusters. It may also have the capability of delivering CW and BW agents by means of guided missiles.

(5) An increased awareness of the potential of CBR weapons by the Soviets is indicated by:

(a) The high priority allocated the CBR field by Soviet military and political leaders.

(b) Evidence of an extensive research and development program on the nerve gases, of the development of

psychochemical and incapacitating agents and antidotes or prophylaxis for chemical and biological agents. In addition means of effectively disseminating chemical and biological agents are being developed.

(c) The capability of producing CW and possibly BW agents in quantities sufficient for offensive operations by the Soviet and Satellite armed forces.

(d) A well-established military organization for offensive and defensive CBR operations.

(e) The widespread issue of good to excellent quality CBR defensive equipment to both military and civil defense organizations.

(f) The emphasis on extensive CBR military and civilian defensive training.

b. Discussion

(1) Soviet CBR Policy and Doctrine

(a) During the past several years, Soviet military and political leaders have stated on many occasions that chemical and biological weapons as well as "other means of mass destruction" will be used in future wars. For example, in 1958 Colonel J. S. Baz of the Soviet Army noted in an article entitled "Soviet Military Science on the Nature of Modern War," that "it is necessary to consider that modern means of attack, primarily aviation and rocket equipment, and atomic, thermonuclear and chemical weapons 'simplify the possibility of achieving a surprise attack and are particularly dangerous." The Soviet government also has made many awards, including the military orders, as well as the Stalin and Lenin prizes and the Order of Lenin, to individuals and organizations connected with some phase of CBR warfare.

(b) Soviet doctrine for future war is believed to encompass the use of atomic, chemical and biological weapons, in that order. In Soviet tactical doctrine, toxic chemicals are considered a conventional weapons system for offensive or defensive use in conjunction with other weapons systems. Chemical weapons,

referred to primarily as tactical weapons, are considered as a "means of mass destruction" to be used to achieve maximum surprise, either alone or coordinated with nuclear weapons. Concurrent with the promulgation of this doctrine was the announcement of a policy which permitted the army front commander to decide whether toxic chemicals would be employed. This decision had previously been made on the national level. Nonpersistent chemical agents are to be used in those areas where immediate occupation by Soviet forces is planned. Persistent agents are to be used chiefly in a denial role, to slow an enemy, or to limit the ability of enemy reserves to support units under immediate attack or prevent such support entirely. There is no firm evidence of specific Soviet BW doctrine. However, the BW doctrine of the USSR is believed to be in consonance with the Soviet consideration of BW as a mass destruction weapon to be employed against large or strategic areas and troop concentrations.

(2) CBR Research and Development

(a) In support of its CW effort the USSR has a comprehensive, productive research and development program. Soviet CW interests are apparently centered primarily on the highly toxic nerve gases of the "G" and "V" series and on the nonlethal psychochemicals and incapacitating agents. Other CW related research includes aerosol studies, improved delivery means, detection and identification of toxic substances, and the improvement of existing agents.

(b) The BW research and development efforts of the USSR concentrate primarily on the antipersonnel diseases of anthrax, plague, tularemia and brucellosis and the anti-animal diseases of rinderpest and hoof-and-mouth disease. Soviet BW research also includes field testing of candidate agents, development of dissemination devices and delivery systems, efforts to develop a system for rapid BW agent detection and identification, development of polyvalent vaccines with special emphasis on immunization against aerosol-delivered respiratory infections, and aerogenic immunization techniques.

(c) The Soviets also have an active research and development program designed to improve their CBR defensive capability. The standard Shlem-1 gas mask has recently been

modified by the addition of a double outlet valve which overcomes the former Soviet vulnerability to nerve gases and BW agents. Much emphasis has also been reported on the development of antidotes for war gases and effective treatment of CBR casualties.

(3) CBR Offensive Materiel

(a) The USSR is estimated to have a stockpile of approximately 200,000 short tons of toxic chemical agents, approximately half of which is in filled munitions and half in bulk. This stockpile is considered the minimum offensive requirement of the Soviet forces for a six-month period and is believed to be composed primarily of nerve agents and mustard gas. To maintain this stockpile, the level of toxic agent production is currently estimated at about 20,000 tons annually, with nerve agents comprising the bulk of the production. For delivery of toxic chemicals the Soviets have agent-filled munitions for rockets, mortars and artillery, land mines, aerial spray tanks, bulk-filled and cluster bombs and possibly agent-filled warheads for surface-to-surface missiles. In addition to toxic agent munitions the USSR has manpack and mechanized flame throwers and a variety of smoke pots and generators.

(b) There is no direct evidence that the Soviets are producing or stockpiling biological agents or special biological munitions although they have the capability to do so. Biological agents can be delivered in the same manner as chemical agents in large and small-scale overt operations, and by devices of special design in small-scale covert operations.

(c) The Soviets are probably not producing or stockpiling radiological agents and probably will not have an RW capability in 1961. The Soviets have mentioned mixtures of BW and RW agents in recent publications. Such combinations would increase the defensive problems of identification of agents and treatment of casualties and could increase the effectiveness of the agent through the combined effects on the human body.

(4) CBR Defense Materiel

(a) The Soviet armed forces are well supplied with good to excellent quality CBR defensive equipment. The

individual Soviet soldier is equipped with a good gas mask, a protective cape or cape-groundsheet, protective gloves, and protective boots or buskins. Recent reports indicate that the combat soldier now is also issued a lightweight protective suit of jacket and trousers. Heavy rubberized protective suits are available to special units assigned decontamination missions or for toxic agent-munitions filling operations. Each Soviet soldier also has an individual decontamination packet for decontamination of his skin and individual equipment.

(b) An adequate chemical agent detection and identification kit is available to Soviet forces. The equipment in this kit can detect the standard toxic chemical agents including the "G" series nerve gases, but it is doubtful if it can detect the "V" type nerve agents. Detector crayons and detector powder are also available for chemical agent detection. There are no known automatic CW or BW alarms available to Soviet troop units for rapid detection and identification of such agents. However, the Soviets are reported to have a priority research and development program under way to produce automatic CW and BW alarms. An automatic CW alarm may be available for limited issue in 1961. It is believed that a BW alarm will not appear within the next several years.

(c) Soviet decontamination techniques are essentially the same as those of the West for both CW and BW contamination. A variety of decontaminating equipment, both portable and power-driven, is available for equipment and terrain decontamination.

(d) Recently the Soviets accepted atropine as the antidote for nerve gas poisoning although they are continuing research for a better one. Atropine is available for administration by medical personnel and may possibly be on general issue to the individual soldier in the antichemical first aid packs.

(e) For detecting radioactive contamination the Soviets have issued three portable radiac instruments:

1 A survey meter for determination of radioactive contamination of areas.

2 A fountain pen-type dosimeter for recording total dosage received by an individual.

3 A meter with probe and earphones for monitoring purposes.

(5) Organization

(a) The USSR has a well-established CW organization directing an integrated and highly developed program. The center of military CW activities is the Directorate of Chemical Troops of the Soviet Ground Forces. This headquarters controls all chemical personnel in the ground forces, and probably in all the armed forces.

(b) The major chemical unit of the Soviet Ground Forces is the gas defense brigade which is normally assigned on the basis of one per army front. The gas defense brigade is composed of two CW defensive battalions and is also believed to have two chemical offensive rocket or mortar battalions. Each army is reported to have a CW defense battalion, each line division a CW defense company, each regiment a CW defense platoon and each battalion a chemical section. Flame thrower battalions are also reported in the Soviet Ground Forces organization and are available for assignment as the tactical situation requires. In addition chemical staff officers are organic to all units from army to regimental level. It is estimated that the total number of authorized personnel in the Soviet Chemical Service is approximately 100,000 men.

(c) No over-all organization can be positively identified as responsible for an offensive BW program although it appears that operational responsibility for this program rests with the Ministry of Defense. Defensive aspects of BW are the responsibility of the Main Military Medical Directorate.

(6) Training

(a) Training in both offensive and defensive aspects of CW in the Soviet armed forces is conducted on an extensive scale. Training in offensive employment of chemical agents has been increased in command post exercises according

to recent Soviet military publications. The actual use of mustard and phosgene oxime in regimental-size field exercises has also been reported, with emphasis on crossing contaminated areas to give troops confidence in their protective equipment.

(b) The Soviet soldier is trained to consider CBR as the expected rather than an unusual type of warfare. Considerable emphasis is placed on CBR defensive training of the individual to include principles of protection, detection, crossing contaminated areas and decontamination.

(7) Conclusions: It is estimated that:

(a) The USSR has the immediate capability of beginning and sustaining offensive CW operations on a large scale and of defending against CW attacks.

(b) The USSR is probably not prepared to wage large-scale overt-type BW, but it is capable of carrying out small-scale covert-type BW operations on selected targets. The Soviet capability of defending against antipersonnel and anti-animal biological warfare agents is good, but against anticrop agents is poor.

(c) The USSR has no known capability at present of employing radiological agents in military operations and probably will have none within the next year. It does have a capability of defending against such agents and against radioactive fallout from nuclear weapons.

2. (S) Satellites

a. Summary

The Soviet Satellites (East Germany, Poland, Czechoslovakia and Hungary) have no capability of engaging in offensive operations with chemical, biological or radiological weapons although they do have the industrial capacity to produce CW and BW agents. They have a fairly good capability of defending against CBR attacks by reason of partial or in some units complete supplies of protective equipment, and good training. During hostilities the USSR will