14. THE INVOLVEMENT OF LOCAL, REGIONAL AND FEDERAL AUTHORITIES IN RESPONDING TO THE SAKHALIN 1995 EARTHQUAKE DISASTER*

Boris N Porfiriev

Introduction

Sakhalin Island is in the far eastern area of Russia between the Okhotsk and Japan seas. The territory covers more than 76,000 square kilometers and is separated from the mainland by the Tatar strait. It has a population of more than 700,000 living mainly in the southern part of the island and working primarily in fishing, fish and seafood processing, ship repairing, and the wood and paper processing industries.

The industrial landscape of the northern part of Sakhalin Island consists of oil and gas fields owned by the federal corporation, *Sakhalinmorneftegaz*. This company extracts and through undersea pipelines pumps oil and gas from Okha City to the mainland. The Okha rayon (or subregion) has several towns and settlements where mainly oil and gas miners and their families live.

In that very rayon, not far from the town of Neftegorsk, the earthquake occurred late at night at 1:04 a.m. local time on 28 May 1995 (5:04 p.m. Moscow time or 1:04 p.m. Greenwich mean time on 27 May 1995, respectively). It resulted in about 2,000 deaths and destroyed the community of Neftegorsk. That makes this disaster not only the worst of its kind in Russian history but, in a sense, one of the worst in world history. A fatality rate of about 66 percent of the population at the time of the earthquake made it one of the most tragic disasters ever.

The earthquake, with a magnitude of 9 on Richter scale had its epicenter 33 kilometers deep in the Okhotsk Sea, to the east of Okha City, at 52.8 degrees North and 143 degrees East. At the town of Neftegorsk and at Okha City the quake force was approximately 7.1-7.6 and 5-6, respectively. The main shock lasted two-three seconds followed in about an hour by aftershocks with nearly the same magnitude.

The earthquake affected a territory of about 15,000 square kilometers. This involved a population of more than 55,000 persons including 3,200 residents of Neftegorsk as well as that those who came into that city on weekends (the statistics cited come from: Ostrovskaya et al, 1995; Shoigu, 1995; and Zaitsev, 1995).

The aftermath of the earthquake

As a result of the earthquake, 17 of 22 large residential buildings with 80 apartments in each, and also the building of the local office of the Department of Internal Affairs (DIA) and of the town club were totally destroyed. This entrapped from 2,500 to 3,000 persons. According to estimates of the Ministry of the Russian Federation for Civil Defense, Emergencies and Elimination of the Consequences of Natural Disasters

(MCS), the total number of fatalities was 1958 which includes those who died in the hospitals. In addition another 386 persons who survived were hospitalized(see Goncharov, 1995; Rasporiazheniye, 1995a; Shoigu, 1995; Treschina, 1995; Zaitsev, 1995). There was also the total destruction of the school, the boiler room, the dining rooms, the bakery, and the shop of *the Vostokneft* (affiliate of the "Sakhalinmorneftegaz") office building. Also four two-story residential buildings with 16 apartments each, three kindergartens and water pipelines were partially destroyed. Since none was published after the earthquake, we have no data about the status of more than 1,500 private homes and those who lived in them.

The impact of the earthquake also led to the collapse of all bridges on the Neftegorsk-Okha road, the rupture of 300 kilometers of communication and 200 kilometers of electrical grid lines. Also affected were an additional 45 kilometers of oil and one kilometer of gas pipelines and three oil and gas terminals, although this did not result in any serious environmental problems. According to some estimates, in Neftegorsk alone the direct economic loss from damages to residential and infrastructure buildings was more than $100 US million dollars, and if indirect losses are considered, this figure is probably tripe that (see Koff, 1995).

The disastrous effects of this earthquake were the result of several factors that have much in common with those that lead to the tragic consequences of the well known 1988 Spitak earthquake in Armenia. First, there were the loopholes in the USSR Standards and Regulations for Construction that were operative in the mid 1960s when the bulk of multi-apartment residential buildings in Neftegorsk were built. Second, there had been wrong construction materials used in the construction and there was poor quality in the construction work.

Those very two factors, both closely linked with cost-saving construction policy in the former Soviet Union, were responsible for the total destruction of all 17 large panel "old" houses built in Neftegorsk in the late 1960s - early 1970s. At the same time a few "new" houses constructed in 1979-1983 were only slightly damaged. If we compare these data with the aftermath of the Great Hanshin-Awaji Earthquake in Japan in February 1995 that ruined a considerable part of the city of Kobe, we can see that the pattern is different: totally destroyed were 66 percent of the "old" and 3 percent of the "new" buildings (Koff, 1995; Great Hanshin-Awaji Earthquake, 1995).

It is also worth noting that total collapse of the "old" large panel buildings in Neftegorsk resulted in very massive heaps of rubble with only few empty spaces within where victims might survive and which could ease the operations of search and rescue teams. This can be contrasted with the collapse of the flat-slab construction in the 1985 Mexico City earthquake that generally provided greater opportunity for possible survivors and rescue teams (Armenia Earthquake, 1989: 145)

Third, the ruinous effect of the Sakhalin disaster was aggravated by loopholes in the prediction systems for earthquakes. Russian seismologists had believed that the

Kuril-Kamshatka region where major earthquakes had occurred in 1994-1995 was the most vulnerable in that area, while Sakhalin Island was not considered as too hazardous (Tsarev, 1995a). In addition, 19 of the 22 seismological stations that existed in the Far East in 1994, including the one in Okha City, had become inoperative because of the lack of budget funds (Riabchikov, 1995; Tsarev, 1995a).

Finally, a time factor also increased the death toll of the Sakhalin disaster. The earthquake happened late at night on a weekend when people were either at home or at the club. In addition, the night temperature in the affected area in May is often less than zero degree (C) which considerably worsened the situation of trapped persons trying to survive the cold and exposure for several nights.

The organizational response of local, regional and federal authorities

As is well known, the efficiency for responding in the aftermath of disasters, depends partly on the quality of training of the search/rescue, medical, fire, police services, and on the logistics and materiel support of those organizations, and also the sufficiency and continuity of information and messages. Associated with these key factors is the time for making and executing decisions that in turn depends largely upon the reliability and operativeness of the warning and information support systems.

The collection and assessment of information.

The initial stage of the response to the earthquake was characterized by a substantial delay in the obtaining of information about the scale of disaster. That stemmed both from the disastrous nature of the earthquake that disrupted communications, along with the underdeveloped and poor quality of the telephone and information services in Russia as a whole, and particularly in its remote regions such as Sakhalin.

According to some sources, a police officer from the neighboring town of Sabo, 20 kilometers from Nefetgorsk, was the first who informed local authorities about the tragedy. Unable to contact the Neftegorsk DIA by phone after the earthquake, he decided to go there himself. Meanwhile the DIA building in Neftegorsk had been already totally destroyed, killing six officers and injuring another four (six others were missing at that time). In less than in hour, the officer came back to Sabo and called to Okha City but the information he provided was considered as incomplete and requiring verification (Kozlova, 1995; Ostrovskaya et al, 1995).

At the same time, because of the rupture of telephone lines and having no alternative communications, the administration and the Civil Defense Service (CDS) staff of Okha City could not verify and specify information concerning the situation in Neftegorsk and five neighboring towns At 1.20 a.m. (hereupon Moscow time) on 28 May 1995 the Mayor of Okha City, despite heavy fog, issued an order for helicopter and mobile ground reconnaissance of the stricken area

The feedback from the reconnaissance groups reached Okha only by 1:50 a.m., thus leaving local, regional and federal authorities unaware for nearly nine hours about the magnitude of the consequences of the earthquake! An hour later, at 2:55 a.m., the Chief of Staff at the Okha CDS obtained and transmitted to Moscow information about the ruptures of the local gas pipelines and the numerous fires. Much earlier, at 5:46 p.m. on the previous day, 27 May 1995, the data concerning the earthquake *per se* and its coordinates were transmitted through the Ministry of Defense of the Russian Federation (MOD) and received at the Far East Regional Center of the MCS in Khabarovsk and the MCS Emergency Operation Center in Moscow. Yet even in this case, the delay in the information exchange exceeded 40 minutes (Dibskiy and Trofimov, 1995).

The making of decisions and their implementation by the local authorities of the Okha rayon, concerning the situation at Neftegorsk, was complicated by the difficult situation in Okha City itself. Its buildings and 37,000 citizens had suffered earthquakes of 4-5 degrees on the Richter scale that created cracks and breaks in some buildings. Learning about that at 5:51 p.m., on May 27, the City Mayor and Chief of Staff of the Okha CDS left nine minutes later for a ground reconnaissance of impacted districts.

As a result of receiving information from Neftegorsk, the authorities in the Okha rayon also initiated rescue measures in that town. At 1:50 a.m., on May 28, the rayon administration issued an order for movement of a composite fire team from fire depot #10. That team consisted of three squads (12 firemen) mounted on tank trucks. At 2:14 a.m. the Chief of Staff of the Okha CDS reported that helicopters with physicians and medical supplies and also five buses usable for evacuation of affected victims were ready to leave. Later, those helicopters were used to transport the first group of survivors to Okha City (Dibskiy and Trofimov, 1995; Yurin, 1995).

No less active were the administration and the oil and gas miners from the *Sakhalinmorneftegaz* company. As a result of getting information about the earthquake and an expressed assessment of the scale of the tragedy, they sent two mechanized columns with special equipment from Okha City and Nogliki Town to Neftegorsk. By 2:00 a.m., on May 28, the group from Okha reached Neftegorsk, and more than 390 workers, using 120 pieces of equipment including welding units and chisels, started rescue operations. Later that day, they worked on repairing the phone system and set up temporary camps and kitchens to provide hot meals for the affected persons. The professional rescuers that arrived later also used these facilities (Yurin, 1995).

Undoubtedly the volunteers among the oil and gas miners lacked necessary experience and they probably inefficiently used their means and forces. The local authorities from the Okha rayon also did not have the special equipment for pulling down ruined buildings, or had the transportation necessary for rescue services. The situation definitely called for the active participation of both regional authorities from

the Sakhalin oblast, neighboring Khabarovsk and Primorsk krayas (or regions) and from the federal government, especially the MCS.

The organization of search and rescue, fire extinguishing and counter looting operations.

The planning and execution of search and rescue operations were considerably influenced by the experience accumulated by the respective MCS branches in their field training for responding to major earthquakes in the Far East region. Using a seismological forecast that an earthquake would most probably strike the Kamchatka peninsular in summer-autumn 1995, the MCS on March 27, 1995 issued order #215. It was entitled *On Measures for Upgrading the RUSES (Russian System of Preventing and Eliminating Emergencies) Preparedness for the Liquidation of the Consequences of a Possible Earthquake at Kamchatka.* It also conducted special field exercises attended by high officials from the federal government (Shoigu, 1995). However the real events occurred at another place and with a different scenario, which thus required inserting modifications into the operational plan that had been developed.

After clarifying the situation, the MCS Crisis Management Center in Moscow and its Far Eastern Regional Center in Khabarovsk from 12:40 p.m., May 28, functioned on an emergency basis. On the same day, the Operation Center in Moscow, the operation task forces of the MCS Far Eastern Regional Center in Khabarovsk, Okha, Neftegorsk and that of the regional (oblast) CDS staff in the city of Yuzhno-Sakhalinsk, were organized and very actively started to work.

At 6:00 a.m., the Governor and the Chief of Staff of the CDS of Sakhalin oblast together with five rescuers from the Sakhalin Search and Rescue Service (SERES) and eight physicians, left from Yuzhno-Sakhalinsk for Okha. At 6:50 a.m., a group including eight rescuers, six surgeons, and 13 servicemen of the central airmobile team of the MCS (CENTROSPAS) special brigade also went from Moscow to Okha City. At 8:15 a.m., a Mi-8 helicopter of the MCS special helicopter team left from the Khabarovsk area directly for Neftegorsk. At 8:45 a.m., the MCS Operation Task Force headed by the MCS minister and including 23 CENTROSPAS rescuers left from Moscow for the disaster area (see Dibskiy and Trofimov, 1995; Shoigu, 1995).

Later there was a substantial increase in efforts to transport deliveries into the disaster area, as well as the means and forces of the regional and central chapters of the MCS. Within 24 hours, on May 28-29, the number of rescue personnel and equipment pieces was augmented more than four and two times respectively. These means and forces served as a nucleus for the search and rescue operation in disaster area. This involved a concentration of 37 percent of primarily professional rescuers among the total personnel. In addition, another 18 percent of the operational group personnel was composed of industrial and municipal rescue teams from the Far Eastern region, 14 percent by those from the Far Eastern military district of the MOD, and 31 percent of volunteers. After May 30, the operation group, although the strength

of its personnel varied through time, numbered up to 1,600 persons, about 190 pieces of equipment, 20 planes and 15 helicopters (Shoigu, 1995).

The extensive transportation provided, and the concentration of all means and forces and their coordination by the MCS Operation Task Force facilitated intensive and effective search and rescue activities undertaken in an extremely complex environment. During the first day, May 28, 150 victims were extricated from the rubble. The next day this figure increased by 30 percent. In two days it doubled with more than 300 persons being found, more than half of them alive. Unfortunately, later on, the time factor mentioned earlier worked against the rescuers and from June 4 only dead bodies were extricated from the ruins. By June 10, when rescue operations were stopped the total number of those extricated from the rubble had soared to 2,364 including 1,958 dead (268 of which were children), and 406 alive. Later, 31 persons of those rescued alive died in hospitals, increasing the number of fatalities up to 1,989 (Shoigu, 1995).

Extrication of the victims from the rubble and debris removal was accompanied by fire service support which included extinguishing fires and preventing fire outbreaks at the base camp. After the 17 large panel residential buildings had collapsed, the rubble of two of them immediately caught fire Nobody could extinguish the fire for several hours given that the fire team in Neftegorsk had been dismissed, because of a lack of funds, a few months before the earthquake.

That is why the extinguishing of local fires started only at 5:00 a.m., on May 28, when the teams of fire depot #10 of the Sakhalin oblast DIA arrived on the scene. Later, on May 28 and 29, carrying out the order of the oblast Governor, two teams of 25 well-equipped firefighters from the Regional Special Team (REST) #5 of Kamchatka oblast DIA reached the disaster area, and started fire extinguishing operations. On the next day, those operations were intensified by the special team of 12 firefighters who came with rescue equipment from the Sakhalin oblast State Fire Service (SFS). In contrast to the Spitak earthquake in 1988 when firefighting activities were managed in the field (Armenia Earthquake, 1989), in Neftegorsk since May 30 all fire fighting activities in disaster area were commanded by regional and federal coordinating officers, who had in particular come from the Sakhalin oblast SFS in Yuzhno-Sakhalinsk and the Chief SFS Department of the Ministry of Internal Affairs of the Russian Federation (MIA) in Moscow. From May 28 to June 9, the elements of the SFS of the MIA extinguished 13 fires in the rubble and in the base camp, extricated 92 persons including 17 live ones, while directly participating in rescue operations at one of the demolished buildings.

Despite the complete damage of the DIA building and death of 70 percent of the police officers in Neftegorsk, social order and security were effectively maintained throughout the crisis. On May 28, the Operation center of the Sakhalin oblast DIA formed and sent to Neftegorsk from Yuzhno-Sakhalinsk a group of 24 police officers, including four counterlooting teams (14 persons strong). As early as the first day, these teams stopped seven looting attempts in Neftegorsk (Ostrovskaya et al, 1995).

In addition, 49 police officers were ordered to go to Okha City to provide security support for the evacuation and relief assistance to Neftegorsk that passed through the local airport.

Medical and health care support. Hospitalization and evacuation of victims.

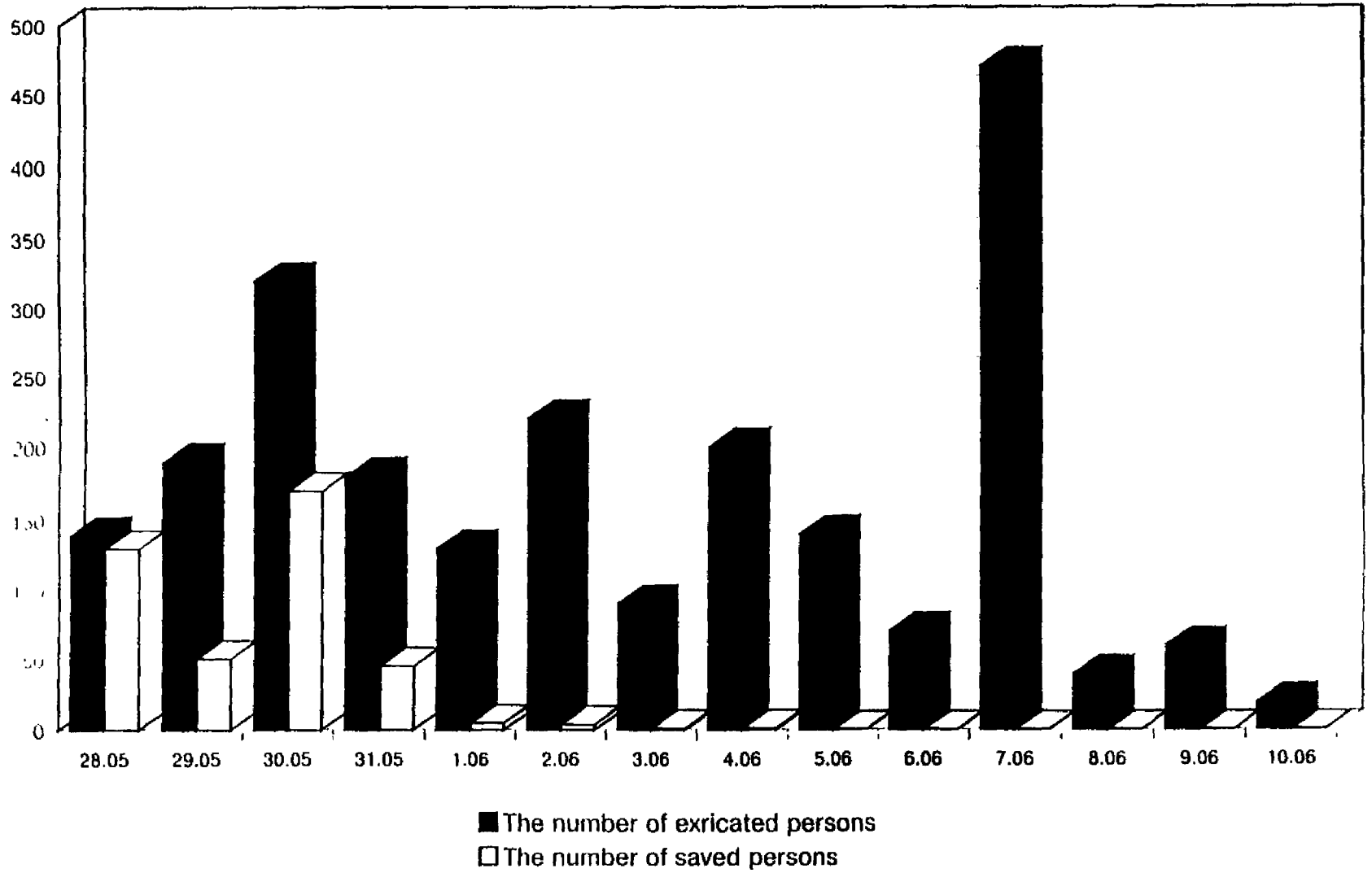
The earthquake damaged medical facilities and killed medical personnel, in particular 30 physicians from the local hospital in Neftegorsk. That substantially complicated the implementation of urgent medical and health care measures in the first hours. However, problems of the initial stage of response were overcome due to the timely reaction of the All-Russia Emergency Medical Care Service (Goncharov, 1995).

As early as the morning of May 28, medical teams from Okha rayon and Yuzhno-Sakhalinsk started providing treatment to those who were successful in getting out from the under the debris. Before the main means and forces provided from Moscow and the Far East region arrived, more than 100 patients received emergency medical care. By the end of that day the number of physicians working in the disaster area reached 40, thanks to the arrival from Khabarovsk the personnel from the Far Eastern Emergency Medical Regional Center. The number of those who received medical care thus increased to more than 120, including 107 who had been seriously injured and who were then evacuated to Okha City.

Starting May 29, the brigade from All-Russia Emergency Medical Care Center *Zaschita,* including well-equipped specialists with much work experience in conditions of mass casualties, started providing high-level professional assistance (Goncharov, 1995; Shoigu, 1995). In addition, medical supplies arrived from Surgut, Ufa, Perm, Khabarovsk, Vladivostok and other places including foreign ones. Two mobile medical posts with six changing medical teams functioned directly on-site in Neftegorsk, while in Okha City another mobile facility with 40 physicians and 28 nurses was activated (Gvozdikov, Ostrovskaia and Litovkin, 1995). In total, medical care was given to 510 victims including 180 children. The field hospital deployed by *Zaschita,* as close as 20 meters to ruins, undertook 42 urgent amputation operations, including 15 to children (Goncharov, 1995).

Additionally, the Sakhalin oblast and the Khabarovsk and Primorsk administrations substantially contributed to an organized evacuation and hospitalization of 203 patients in clinics of Okha City, as well as 98 to Khabarovsk, 43 to Vladivostok, 40 to Yuzhno-Sakhalinsk and one to Nogliki town. A very seriously injured person was hospitalized in Moscow. The regional authorities also took active measures to provide assistance to the homeless; 72 persons were relocated to Okha City and 51 to Yuzhno-Sakalinsk (Shoigu, 1995).

Fig.1 The results of rescue operations



Because of damages to and breaks in lifelines, especially primary water and sewage systems, many human and animal dead bodies complicated the epidemiological situation in the disaster area. On May 29, a special team of 14 specialists organized by the State Sanitation and Epidemiological Inspection Service of the Sakhalin oblast started its work in Neftegorsk. By June 13, they succeeded in carrying out 69 tests of the water supply and 86 of food items. They also carried out disinfection and deratization measures on 154,000 and 160,000 square meters, respectively, providing thorough sanitation control at burial places, etc., thus successfully keeping epidemiological safety in the disaster area (Goncharov, 1995).

Official high-level response.

The earthquake in Sakhalin and the tragedy of Neftegorsk drew the special attention of the highest federal administration. After getting the first formal message about the earthquake from the MCS at 8:06 a.m., on May 28, the President of Russia was kept constantly informed about the new data on casualties, losses and rescue operations progress. On May 30, the President appeared on television to express condolences for the families of victims and to declare the next day as a national day of mourning.

The federal government played an active role in the emergency. The Council of Ministers of the Russian Federation after receiving the aforementioned message early in the morning of May 28, immediately issued an order making the Intergovernmental Commission for Emergency Prevention and Liquidation headed by the MCS minister, S. Shoigu, responsible for the urgent organizational response in the disaster area. The responsibility of the Commission was to serve as the principal coordinator for the federal, regional and local executive bodies involved, to estimate the scope of relief needed, and to develop measures necessary to alleviate the aftermath of the earthquake in the Okha rayon of the Sakhalin oblast.

At the same time, the order entrusted the Ministry of Finance to allocate to the MCS an additional 30 billion roubles (about $7.5 US million dollars) for urgent search and rescue operations and medical care support while Goskomrezerv (the State Committee for Material and Technical Reserves), the Ministry of Transport and the Railway Ministry was made responsible for providing and delivering necessary supplies requested by the MCS. These proscriptions helped the giving of one million roubles (approximately $ 250 US dollars) in a lump sum to every affected person, including as early as June 1, to the first 93 men and women that received the aid (Rasporiazheniye, 1995a; Neftegorsk, 1995b).

Just after the issuance of the order, and following the MCS Operation Task Force, the Federal Governmental Commission composed of the Ministers of Health and the Medical Industry, of Transport, of Railways and of the Construction Industry and lead by the First Deputy Chairman of the Council of Ministers, left for Sakhalin. The results of their on-site surveillance and consultative activities were later used as a basis for decision making on relief assistance and the future of Neftegorsk.

As to relief assistance, the Government of Russia issued two regulations and one order dated June 2 and 3 respectively (Postanovleniye, 1995a; 1995b; Rasporiazheniye, 1995b). These regulated the flow of financial aid, 107 billion roubles (about $27 million US dollars), earmarked for the impacted area. These documents also prescribed the providing of a lump sum of individual family financial aid of the aforementioned one million roubles ($ 250 US dollars) and 5 million roubles ($ 1,200 US dollars) for burial expenses, as well as compensations of 50 million roubles (about $ 12,000 US dollars) for house and property losses and about 10 million roubles (equal to 200 minimal monthly wages or $ 2,400 US dollars) for a dead family member. By June 6, these allowances and compensations, although incomplete in terms of volume (less than 2.5 million roubles to each) had been issued to 889 victims (Gvozdikov, 1995a).

Another governmental decision concerning Neftegorsk, declared that the town would not be rebuilt and that its surviving residents should be relocated within the Sakhalin oblast, namely to Okha, Nogliki and Yuzhno-Sakhalinsk (Tsarev, 1995b). For that purpose, the Sakhalin oblast and Okha City administrations allocated financial resources for building 71 and 12 apartments respectively, although without doubt it would not be sufficient for the 500 affected families. Financial support was also earmarked to relocate another 183 families who wished to move to the mainland. However, both sets of planned actions along with the intended compensations were confronted by a marked lack of resources. Even two months after the earthquake had happened, full compensations had been issued to only half of the victims, and the relief aid of 107 billion roubles earmarked by the federal government for the affected territory failed to appear at all (Gvozdikov, 1995b).

Conclusion: The efficiency of the response of the authorities at all levels

Undoubtedly the rescue of more than 400 persons should be considered as the main result of the operational activities of all the executive governmental bodies trying to respond in the aftermath of the earthquake disaster. In the situation at Spitak in 1988, when the holistic system which should provide search and rescue operations in the vast territory of the former Soviet Union was lacking, the reactions of the authorities and services was inadequate. In contrast, the Sakhalin disaster revealed a much more efficient organizational response (although it bears remembering the much less 'absolute' scale of the consequences of this disaster when compared to Spitak). The MCS having experienced rescuers, physicians and other specialists available, together with attached means and forces, was much better coordinated, more operative and fruitful in 1995.

However, the results of the search and rescue operations, the medical care and relief aid to the victims of the Sakhalin disaster, should be considered as only comparatively or partially successful. Obsolete and unreliable communication lines; the lack of seismological stations and other loopholes in earthquake prediction systems;

drawbacks in intra- and interagency information exchange and operational interaction; and the inadequate emergency preparedness of local authorities, contributed negatively to the initial stage of organizational response. The widespread uncertainty, and the lack of meaningful coordination between various organizations and services that are common factors in the early hours of disaster elsewhere (see Rosenthal et al, 1994), should be considered as only a partial explanation of, or better, as a reservation for the situation at Sakhalin in early summer, 1995. The substantial delay in estimating casualties and losses and in the conducting of active rescue operations, decreased their efficiency, and that meant additional number of casualties.

The activities of the local, regional and federal executive governmental bodies trying to provide adequate social support and security to the victims of a major disaster should be considered even less successful. Indistinctive and insufficiently coordinated actions at the stages of response and primary recovery were typical of the reactions by the local and regional authorities. While the MCS functioned operatively and smoothly, the federal executive bodies of the Russian government at the stages of medium and long term recovery acted with interruptions and irregularities. The failure was most pronounced in providing of financial aid and compensation for losses to the victim population that resulted mainly from loopholes in the budgeting redistribution mechanism, the bureaucratic arbitrariness, and the economic crisis in Russia in the mid 1990s.

The Neftegorsk tragedy testifies to a gamut of serious unsolved problems in the mitigation of, the preparedness to, the recovery from, and to a certain extent, the response to disasters This calls for a substantial and not a delayed reorganization of both legislative and executive activities in the field in order to improve the RUSES.

****

*This is a written version of a paper presented in Amsterdam, Holland on April 22,1966 at the 2nd International Conference of Local Authorities Confronting Disasters and Emergencies. This was prepared with the support of the Netherlands Institute of Advanced Studies of the Royal Academy of the Royal Netherlands Academy of Arts and Sciences while the author was working there as a TRIS Fellow. The author owes his special gratitude to Prof. E L. Quarantelli for helpful suggestions and editorial assistance.