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A Significant Nuclear Security Event in Gaziemir-Izmir, Türkiye: Open Letter to the International Atomic Energy Agency

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Abstract: In 2006, a large quantity of clandestine sensitive radioactive materials surfaced at an abandoned scrap metal and lead recovery facility in the city Gaziemir, Izmir, Türkiye. In April, 2007 the TAEK (Turkish Atomic Energy Agency) official experts surveyed the 70,000 m^2 site including the storage buildings. They reported that 20-300 microRad/h of radiation was detected throughout the site, especially high readings of more than 300 micRad/h were recorded inside the storage building containing about 1,100 tons of commercially valuable waste. About 15 tons of waste were taken from the storage building and sent to TAEK's lab in Ankara to be analyzed. In April, 2008 TAEK issued a press release (No: 04/2012) on its official website confirming that their analysis of samples taken from the Aslan facility showed that, there is a scattered radioactive contamination in the Aslan lead-recovering factory. The radioactive isotopes of Europium-152 and Europium-154 were found in the landfilled area, additionally, these isotopes were more concentrated (higher readings) in the commercially valuable waste (approx. 1,100 tons) which was kept in the storage building, a clear indication of the fact that at the Aslan facility, sensitive nuclear reactor parts, including but not limited to nuclear reactors control rods were being melted.

Key words: Illicit, nuclear, materials, trafficking.

1. Introduction

In accordance with the guidance set out in the IAEA (International Atomic Energy Agency) Nuclear Security Series No. 15-24 (June 2024 STI/PUB/2084, https://doi.org/10.61092/iaea.2nzd-8c4d) we, the undersigned stakeholders, hereby informed/reported to Lydie Evrard, Deputy Director General and Head of the Department of Nuclear Safety and Security, IAEA, a significant nuclear security event taking place, in real time, in the city of Gaziemir-Izmir, Türkiye.

In 2006, huge amount of clandestine sensitive radioactive waste materials was discovered at the Aslan Co. Inc. Scrap Lead Purification and Recovery Factory in Gaziemir, Izmir. The evidence presented in this paper suggests that this factory has been operating as part of an illegal sensitive nuclear materials trading organization. The latest expletory radiological-survey-map of the site that is produced in July 2024, by Vecor Co. Inc., clearly indicates that, unknown amount of illicit nuclear materials, specifically nuclear reactor control rods, have been reprocessed at this site to recover sensitive materials. The composition of a typical control rod: 80% Ag-105 Ag-107, 5% In-115, 5%, Cd-113, plus; Euirpium-151 and Hafnium isotopes and boron.

Despite existing Turkish environmental protection regulations and international conventions such as the Basel Convention and the Convention on the Physical Protection of Nuclear Material (GOV/INF/2005/10-GC (49)/INF/6), the Turkish government and the TAEK (Turkish Atomic Energy Agency) did not intervene to stop the facility's operations. Toxic fumes, smoke, and

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occasional bright flames were observed for years, and it is likely that the IAEA was not informed.

This petition provides a brief chronological account of the unethical, inefficient, ineffective, and incompetent conduct of TAEK in dealing with this radioactive contamination. We do not believe the IAEA is fully aware of the potential severity of this issue. We request that the IAEA undertake a site visit to confirm our concerns about the potential risks to human health and the environment. This action may lead to more appropriate guidance for site operators and regulatory authorities on managing and remediating this situation.

The Paragraph 3.10 of IAEA Nuclear Security Series No. 20, Objective and Essential Elements of a State's Nuclear Security Regime [1], states that: "A nuclear security regime ensures that nuclear security systems and nuclear security measures are in place at all appropriate organizational levels to detect and assess nuclear security events and to notify the relevant competent authorities so that appropriate response actions can be initiated, including: … (c) At major public events or strategic locations, including locations of critical infrastructure, as designated by the State; (d) In searches for, recoveries of, or discoveries of nuclear material or other radioactive material that is missing or lost or otherwise out of regulatory control;"

Paragraph 3.18 of the IAEA [2], states that "As part of a broader nuclear security strategy, a joint detection operation plan could be developed for nuclear and other radioactive material out of regulatory control in the State's interior. This plan should involve all competent authorities and other stakeholders with roles and responsibilities in detection activities within the State's interior. Annex II provides an example template with the components to be included in such a plan. The term 'other stakeholders' refers to organizations that are impacted by or expected to contribute to the detection architecture but do not have official or legal authority for nuclear security.

These stakeholders may include private and public sector organizations as defined in Ref. [3]; for example, private companies, facility operators and other users of nuclear and other radioactive material, academic and research institutions, or private health institutions."

Section 4.18 of IAEA [3] states that: "Analytical reports on nuclear security should be disseminated to relevant stakeholders on a need-to-know basis. Through information exchanges among relevant competent authorities, the multiagency information analysis process can build on, and be complementary to, existing information collection and analysis processes. Secure dissemination of analytical reports should be ensured in accordance with existing policies and procedures for the protection of information"

Section 4.19 of IAEA states that: "Information sharing should also extend to competent authorities and other stakeholders operating at different layers of the detection architecture, including at or beyond the State's borders, since a nuclear security event can move through several layers of the systems and measures in place for the protection of targets. An information dissemination strategy outlining processes to share information with regional and local stakeholders can effectively leverage national, regional and local resources while maintaining information security practices".

However, since 2008, the Turkish government has failed to disseminate the information pertaining to possible mitigation/remediation techniques and methods which would be applied on this project. Since the beginning of this problem Turkish government has not been open for a fact-based-dialog with all stockholders. Including sharing any detail information would be violating the trade secrets of the companies involved in this project.

The following is a brief chronicle narrative of the clandestine sensitive nuclear/radioactive materials that have been reprocessed at Aslan Co. Inc. Factory located in Gaziemir-Izmir, Türkiye.

(1) The Aslan Co. Inc. was established in 1941 in the city of Gaziemir-Izmir, Türkiye. Until 2010, the Aslan Corporation's Lead recycling/repossessing factory

produced an average of 4 tons of pure lead every day, by means of melting of old batteries and scrap metals.

(2) Until 2007, almost 70 years of operation, the non-economical waste known as “Bottom Ash” was dumped on the factory’s landfill site (about 70,000 m^2 land please see Fig. 1) and covered with dirt. But, during certain periods of operation, commercially valued bottom ash was stored in a warehouse, and periodically shipped to different repossessing facilities to recover remaining valuable materials/metals (please see Fig. 2).

Fig. 1 The aerial view of the site.

Fig. 2 The valuable waste storge building.

(3) On April 7, 2007, a truck loaded with the valuable bottom-ash-waste from ASLAN's factory, triggered a newly installed radiation monitoring instrument at the gate of the IZAYDAS reprocessing factory, located in City of Izmit. This truck carrying contaminated valuable waste was returned back to Gaziemir, the Aslan factory, and the IZAYDAS informed the TAEK (Turkish Atomic Energy Authority).

(4) On April 16, 2007 TAEK sent its official experts to investigate any possible radionuclides contamination of the ASLAN lead-recovering facility in Gaziemir. TAEK experts surveyed the land filled site as well as the storage buildings. They reported that 20-300 microRad/h of radiation was detected throughout the site, especially high readings of more than 300 micRad/h. were recorded inside the storage building (90 m × 90 m × 12 m) containing about 1,100 tons of so called commercially valuable waste. About 15 tons of waste samples (please see Fig. 2) were taken from the storage building and sent to TAEK's lab in Ankara to be analyzed. Since April 2008, TAEK has revisited the ASLAN's facility several times and have collected more new samples.

(5) On April 4, 2008 TAEK issued a press release (No: 04/2012) on its official website confirming that their analysis of samples taken from Aslan Facility showed that, there is a scattered radioactive contamination in the ASLAN lead-recovering factory. The radioactive isotopes of Europium-152 and Europium-154 which were found in the landfilled area, additionally, these isotopes were more concentrated (higher readings) in the commercially valuable waste (approx. 1,100 tons) which was kept in the storage building, a clear indication of the fact that at the ASLAN facility, sensitive nuclear reactor equipment/parts, including but not limited to control rods were being melted.

However, so far, TAEK has neither disclosed the actual results of their analysis, which may contain the full spectrum of other radionuclides, nor made any official attempt to find out the source/origin of these radionuclides

"Europium-152, europium-154, and europium-155 are produced primarily as fission products (fissioning of uranium and plutonium), europium-152 can also be produced by neutron activation of nuclear reactor control rods… The primary use of europium is in a typical nuclear reactor control rod, because of its effectiveness in absorbing neutrons (composition of the control rods: % 80 Ag-105 Ag-107, %5 In-115, %5, Cd-113, plus; Euirpium-151 and Hafnium isotopes and boron). Other uses have been limited because it is rare and thus very expensive… Europium poses an external as well as an internal health hazard. The strong gamma radiation associated with europium-152 and europium-154 makes external exposure to these two isotopes a concern" [4].

(6) In spite of existing Turkish Environmental Protection Rules and Regulations, and international conventions such as "Basel Convention" and "Convention on the Physical Protection of Nuclear Material (GOV/INI/2005/10-GC (49)/INF/6)" which both are directly applicable to this case, TAEK did not interfere or stop the operation of this facility, and most likely, did not inform the IAEA. Ironically, the only measures that were enforced by the TAEK at this site were that, storage buildings are to be blocked by no access-radiation-warning signs, and no more landfill dumping was allowed. Further, ASLAN Co. Inc. must agree to continue its operation by installing a new radiation monitoring detector at the entrance of the site, which would be directly connected to TAEK's Turkish National Radiation Monitoring Network.

(7) Between 2008 and 2010, while ASLAN factory operated with the ineffective surveillance of TAEK, meaning that none installed radiation detectors, fumes and smoke continue to come out of the landfilled area, especially after a heavy rain, local residents observed bright flames coming out of the ground. Numerous complaints were filed with the Ministry of Environment and City Planning, the Governor of Izmir's office and local Turkish courts. However, the Turkish Government and TAEK officially declared that there is no radioactive contamination on this site, but they admitted that there is a very serious chemical contamination. Therefore, it is not subject to any nuclear safe guard material/waste management's rules and regulations. As a result, all the filed complaints were dismissed by the courts and local authorities.

(8) In October 2010, ASLAN Corporation abandoned the site and moved to a brand-new factory located in the city of Torbali. TAEK officially sealed the Gaziemir site for any other possible commercial use, and placed an environmental protection charge/lean against to 70,000 m^2 property. However, the fumes and smoke coming out of ground steadily increased, due to media and local residents/NGO's (Non-Governmental Organization) pressure, reluctantly, based on the basis of causing chemical pollution, the Minister of Environment and City Planning filed charges, against Aslan Co Inc. Including the senior chemical engineer, Mr. Yildirim Mustafa Irvana, who was working at the Aslan Co. Inc from 1987 until the end of 2007 as a production manager was also indicted.

(9) While the court proceedings were still lingering due to bureaucratic manipulations by ASLAN Co. Inc.'s lawyers, inheritance/new owners of the abandoned facility, blamed their grandfather for polluting the site. However, in the light of upcoming nationwide municipality elections in Turkey, the Ministry of Environment and City Planning, issued a stiff fine of 5.7 million Turkish Lira, approx. 2.8 million US dollar to ASLAN Co Inc. on October 10, 2013, for causing chemical pollution, which will be imposed/implemented, if the ASLAN Co. Inc. fails to clean up the site. But the cleanup standards and time frame were not clarified.

(10) In 2014, in order to not to pay the 2.8 million dollars fine, and avoid the criminal charges, the Aslan Co. singed a contract with a new company named the Turanlar Waste Management Recycling Environment Private Health Services and Energy Transport Trade Inc. to clean up the site. Without a comprehensive EIA (Environmental Impact Assessment) report, further, the Turkish government dropped the charges against Aslan Co. Inc. and Mr. Yildirim Mustafa Irvana.

(11) In December 2016, Mr. Arif Ali Changi, an attorney representing the local NGOs filed a complaint in Izmir High Court against the Aslan Co. Inc. and Turan Corporation challenging the scientific merit of the cleaning agreement. Mr. Yildirim Mustafa Irvana was a key witness at the hearing. Mr. Irvana has admitted that in the Aslan lead recovery facility, in late 2006, he has witnessed that the nuclear reactor control rods were delivered to the site in lead containers. As a result of melting these containers about 75 tons of the lead was recovered.

(12) In December 7, 2016 hearing, he testified that between October 2004 until the end of 2006, during the 27 months of full operation, as a result of melting scrap-metal-old-batteries, more than 18 ton of waste was produced every day, including but not limited to illicit reactor-control-rods. According to his estimate, more than 14.500 tons of contaminated waste were buried in 70,000-m^2 area.

(13) In 2017, the numerous court fillings against unscientific merits of the new Environmental Impact Assessment (EIA), which was approved by, the Turkish NRA (Turkish Nuclear Regulatory Authority) and was based on mitigation of nuclear contamination rather than remediation project. In March 2017, the Turkish government, and newly formed NRA have issued new permits to the Turan Co. Inc. for this project, which was based on removing away to an unknown location of 50 ton/day (15,000 ton/year) radioactive waste materials and contaminated land in return for Turan Co. Inc. to recover 3,000 ton/year aluminum, 300 ton/year copper, 600 ton/year zinc, 5,000 ton/year lead from contaminated land/site for cleaning service. However, for unknown reasons the Turan Co. Inc. has abandoned the site before any process.

(14) This site was abandoned until March, 2023, when the EKOVAR (Environment Group Recycling Waste Storage Construction and Contracting Industry Co Inc.) was authorized by the Turkish NRA to resume the abandoned project under a new title called Gaziemir-Environmental-Improvement project by inheriting/using the EIA permits that was issued 6 years ago to the Turan Co. Inc.

(15) In June, 2024. the EKOVAR Group, Environmental Waste Storage and Construction Industry Co.Inc. which is currently authorized by the Turkish government, has submitted a brief description of so called Environmental-Improvement project to the Gaziemir municipality, informing that based on the latest radiological survey of the site (please see Fig. 3) the environment improvements activities will start on July 24, 2024, without providing a comprehensive report about detailing the scientific scope of project. On July 27, 2024, the Izmir Chamber of Environmental Engineers, as per the freedom of information act, immediately has filed an inquiry to the Ministry of Environmental, Urbanization and Climate Change, asking the latest status of the project. On September 9, 2024, the Ministry's official response letter (E-66775017-622.03-10277392) was as follow; "**on July 24, 2024, the EKOVAR group started to carry out the cleaning work, however, due to intense gas emissions, throughout the site, the work has been terminated.** This is an official acknowledgement by Turkish government that there is a Significant Nuclear Event taking place in the greater Izmir-Gaziemir area.

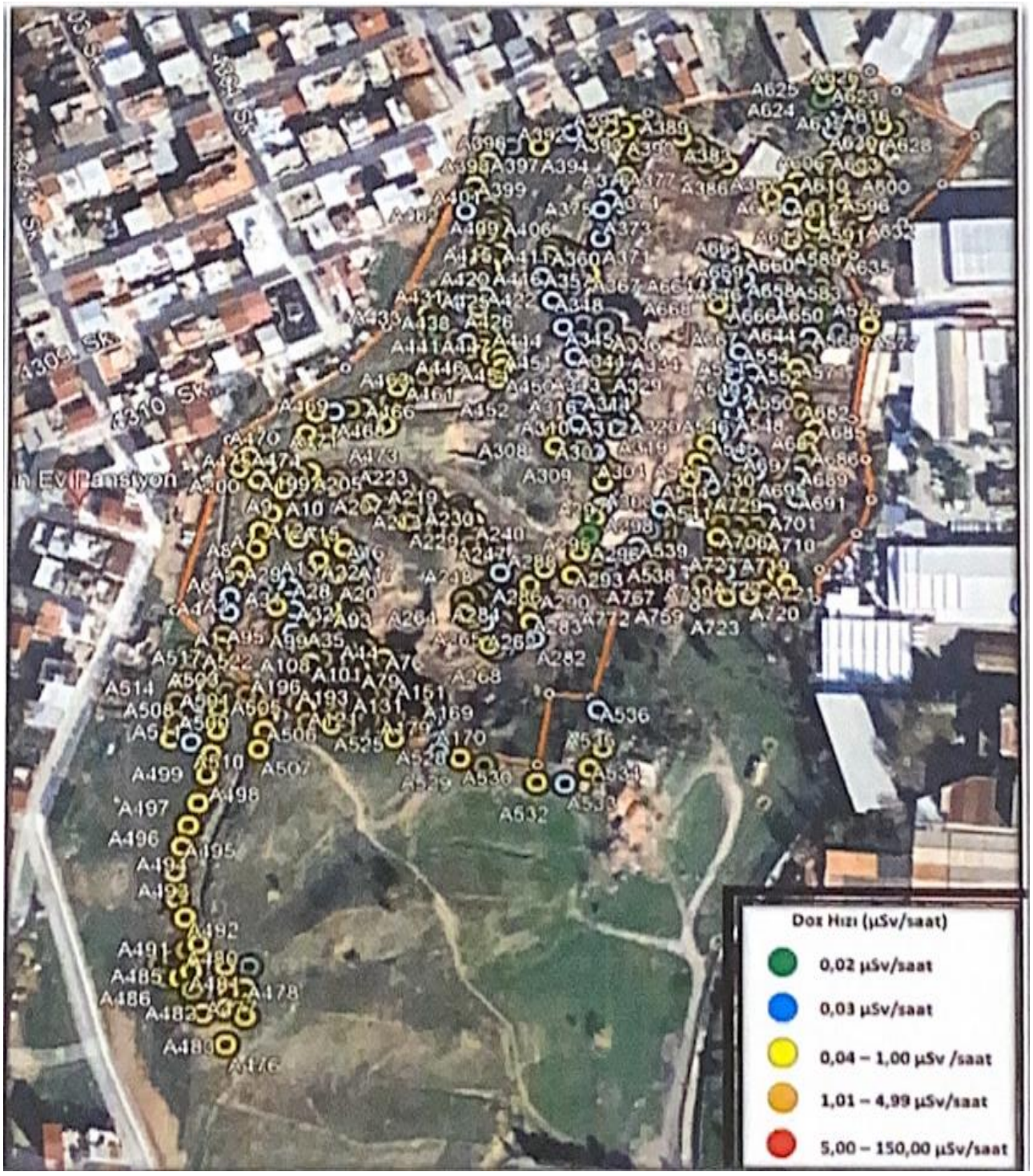

Fig. 3 The latest radiological survey of the site.

3. Urgent Petition

Dear Director Evrard: As of September, 2024, a secondary school which is located only 50 meters away from the fenced landfills area is still open for education (please see the upper left corner of the Fig. **1, marked yellow).** For 70 years, millions of young children and adults have been subject to not only chemical toxic fumes but an unknown degree of radiation. There has been a great deal of health

complications among the local residents; there has been an explosion of handicapped children who were born within this area, ironically, one of the largest handicap clinics in Turkey, which operates at the center of Gaziemir city.

Based on the information collected from Turkish government officials NRA/TAEK's official press releases, Mr. Yildirim Mustafa Irvana's affidavit/testimony and the facts outlined above, we are hereby informing the current Turkish NRA, IAEA and international community that the Turkish government and its subordinate office, the TAEK in the past and newly formed Turkish Nuclear Regulatory Agency have failed to recognize that the Gaziemir ASLAN facility has been operating as an integral part of illegal sensitive nuclear materials trading organization.

Further as per, the IAEA. GOV/INF/2005/10-GC (49)/INF/6 Article 5 of the Convention;

(a) "*a State Party shall take appropriate steps to inform as soon as possible other States, which appear to it to be concerned, of any theft, robbery or other unlawful taking of nuclear material or credible threat thereof, and to inform, where appropriate, the International Atomic Energy Agency and other relevant international organizations*"

Since 2006, the Turkish Government and Turkish NRA have failed to initiate official investigation about the origins of sensitive nuclear materials surfaced in Gaziemir. We believe it is of paramount importance that the IAEA request the Turkish NRA to release all detailed documentation regarding nuclear spectroscopy analysis of samples taken from the ASLAN facility.

We demand that the Turkish NRA should not issue or transfer any permits related to pre-cleanup activities until an independent, nationally and internationally recognized organization, including local experts, has produced a complete comprehensive EIA Report for the remediation of the Gaziemir site. This report should include the true spectrum and dimensions of the nuclear waste buried at this site and further, the latest international safety standards for remediating and restoring the 70,000 m^2 contaminated area, which we believe poses a significant threat to millions of people living in the Greater Izmir area.

Finally, we insist that any EIA and permits granted by the Turkish government must be based on remediation, not merely mitigation, of the Gaziemir site.

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