

MITIGATION OF INSIDER THREAT BY ENHANCING HUMAN RELIABILITY PROGRAM

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Abstract

This paper reflects the Jordanian experience in the Human Reliability Program (HRP). The State issued the first instructions on the HRP for the workers in nuclear facilities in (2015) under the Law on Radiation Protection, Safety and Nuclear Security (No. 43 of 2007), after the establishment of the first nuclear facility in a state that facing significant security challenges from neighbouring countries. In addition, internal challenges of conflict with some regulations and instructions to implement this program, and the mechanism that helps to overcome many challenges and how the implementation of this program to mitigate the insider threats.

1. INTRODUCTION

Jordan remains one of the newcomer countries in the successful implementation of nuclear projects as the Jordan Research and Training Reactor (JRTR) is the first nuclear facility in Jordan.

The security of nuclear facilities has been one of the challenges facing the JRTR as Jordan is a stable country located in a volatile region (Middle East.)

Therefore, we have worked hard to maintain the security of the first nuclear facility in Jordan for all nuclear security aspects: Physical security, Cyber security, Security Culture and HRP.

Dealing with the human side of nuclear security is one of the most complex aspects in all nuclear security; especially for insiders (Facility employees, contractors) and for Visitors to the facility, which called insider threats (whether it is intentional or unintentional).

2. INSTRUCTIONS OF the HRP OF WORKERS IN NUCLEAR FACILITIES

In 2015, Jordan issued its first instructions on the HRP for nuclear facilities. The instructions provided were as follows:

- The operator must set up the reliability program
- The operator should form a team responsible for implementing the HRP
- Applicants who work in critical / sensitive positions are subject to a reliability program
- Conditions for obtaining the certificate of reliability are:
 1. Obtaining security clearances
 2. Obtaining training in the awareness program
 3. Passing the alcohol test
 4. Passing the drug abuse test
 5. Passing the psychological and medical evaluation
 6. Renewing the reliability certificate annually
- Any worker or visitor who does not have a certificate of reliability is prohibited from being in any sensitive areas without an escort
- Applying procedures for behavioral and abnormal change
- All reports received for the HRP are considered confidential

3. HRP IN JORDAN RESEARCH AND TRAINING REACTOR

In 2017, an HRP was issued for the Jordan research reactor for compliance with instructions from the Energy and Minerals Regulatory Commission (EMRC).

3.1 Main Goal

Jordan Research and Training Reactor (JRTR) establishing a specialized section under the nuclear security department with direct responsibility to implement the HRP in the JRTR, to achieve the following goals:

- Mitigate potential insider risk within the JRTR
- Trusted employees in critical/sensitive positions
- Ensure JRTR employees meet the highest standards of reliability and trustworthiness
- Prepare a plan for the HRP in line with the human reliability instructions issued by EMRC
- Establishment of an HRP team to develop the action plan for the HRP, classification of nuclear materials, and sensitive areas within the JRTR and update the list of jobs and employees for any changes
- Establishment of an HRP executive committee for supervise and verify the reliability team for the reliability program, and reviewing the HRP periodically in accordance with DBT and discussing of any other issue belongs to HRP
- Certificates of reliability; This responsibility is one of the most important objectives of the human reliability section, which is issued annually when the following conditions are met:
 - 1- Obtaining security approval
 - 2- Submitting to an awareness programs
 - 3- Passing the drug test
 - 4- Passing the alcohol test
 - 5- Passing the medical and psychological examination

3.2 Competent Authorities

The JRTR is owned by the Jordan Atomic Energy Commission (JAEC), and is considered the first related party to support the HRP in JRTR with the relevant authorities that support and enhance the HRP. Other stockholders in addition to Jordan Atomic Energy Commission:

- HRP Supervisory Committee
- General Intelligence Department (GID)
- Public Security Directorate\Anti-Narcotics Department
- Gendarmerie

3.3 Tasks

The objectives and responsibilities of human reliability section are:

- Set the HRP guidelines(PPP) HRP plan, HRP program and procedures
- The security screening check begins before, during and after the end or termination of work, that is called “employee life cycle”. The reliability program is applied during the employee's life cycle where it begins before the recruitment stage and during the employee's localization in the job to follow the performance and move from position to position to end with the terminate of his work, through :

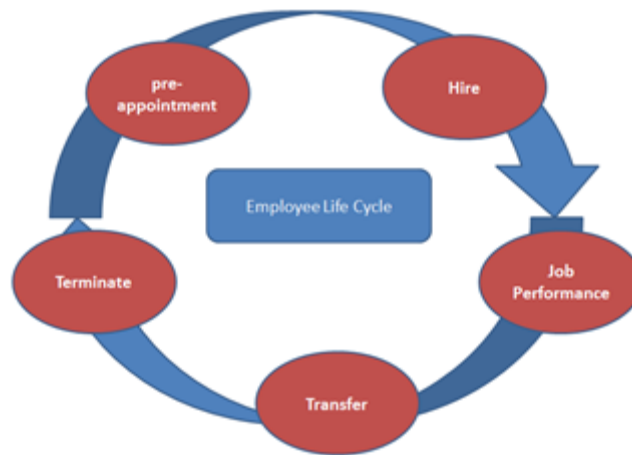


FIG 1. Employees Life Cycle

- 3.3.1 Medical Assessment: Social Media Survey to identify its external connections and trends
 - 3.3.2 Interview
 - 3.3.3 Fill out Reliability form (It takes into account the all family relations)
 - 3.3.4 During job performance the employees are conducting to several procedures (to subject several assessments and follow to several procedures)by the quality department and human reliability section:
 - 3.3.4.1 Appropriate to job description
 - 3.3.4.2 Conformity to the required functional tasks
 - 3.3.4.3 Applies to behavioral change procedures: During the job performance, procedures for monitoring behavioral and abnormal change or abnormal behavior are applied
 - 3.3.4.4 Training and rehabilitation courses are implemented to achieve strong security awareness for all employees
 - 3.3.5 Transfer from position to position and when changing work is subject to all the previous procedures in the item (3.3.4)
 - 3.3.6 Termination of employment due to retirement or resignation is subject to (Termination Procedures) where the process starts with receiving the request for termination and clearance form from the Human Resources Directorate, all access control stopped immediately by the physical security section, then all permission and access to the systems and e-mail are stopped immediately by the cyber security section.
- All of the above is done on the same day and after completion of all the procedures are accompanied then finally conduct the escort procedure to check and sure exit from JRTR,

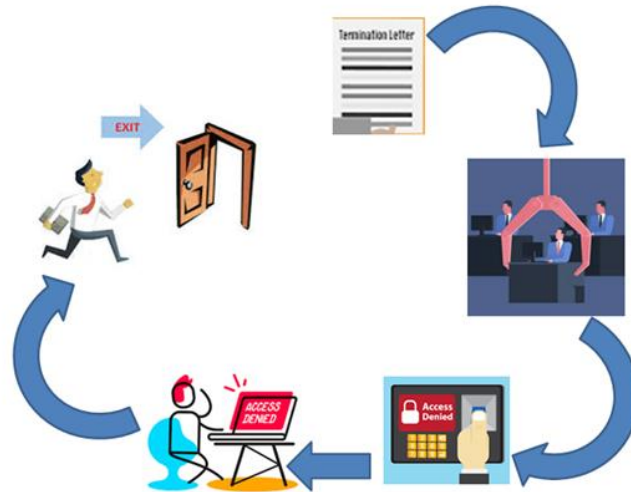


FIG 2. Termination Process

- Addressing the concerned authorities of the General Intelligence Department
- Prepare a database of all positive and negative results
- Prepare a commitment document: All workers in nuclear facilities are committed to it
- Issuing a badge (collaboration between the human reliability section and the cyber security section) based on the reliability and site sensitivity
- Implementation of a personnel screening process, security clearance and access authorization
- Ensure trustworthiness policies are being followed by all JRTR staff
- Recognizing the behavioral change and aberrant or unusual behavior
- Conducted psychological evaluation
- Drug and alcohol testing (randomly and periodically)
- Ensure all personnel within the JRTR should be subject to HRP
- Demonstrate a strong security awareness
- Recognizing and reporting security concerns
- Coordination with the competent authorities
- Ensuring that the staff gain the minimum standards of reliability and trustworthy for working in the different areas within the JRTR
- Nuclear security training and qualification courses are conducted for all the JRTR personnel
- Coordination with Third parties
- Consider all of this as confidential

3.4 Tools

Human behaviour is always coupled with change, thus measuring the development of human capabilities to face personal emotions is vital during the performance of the job. Therefore, technical tools must be used from time to time to measure the level of awareness and capacity development.

The tools that are used for awareness in JRTR include:

- The first tools which employees are educated are the commitment and document.
- Awareness Lectures: Monthly compulsory lectures for everyone, from JRTR director to the workers, and is repeated after a week to those who were unable to attend.
- Awareness posters spread everywhere
- Periodic notification sent by email: reminders of regulations and prohibitions.

After using of various tools to raise awareness, tools must be utilized to measure the extent of response and identify weaknesses in internal threats to focus on them and try to reduce them as much as possible.

Tools used to measure security culture and identify vulnerabilities in the internal threats:

- Electronic Questionnaire : Each employee must access the internal system annually to fill the electronic questionnaire, which contains a set of questions and queries that determine the extent of understanding of the security culture
- Applying the observation procedure, which includes change behavior observation for the staff, through their manager, colleagues and specialists from the human reliability section
- Psychiatric examination: which is done every two years and note the development or degradation of behavior
- Annual Reports: This is an annual HR report that includes staff achievements and areas of weakness(Work history)

3.5 Procedures and Guidelines

As mentioned above, the responsibility of the Nuclear Security Department is to prepare and issue procedures, program and security plan:

3.5.1 Security Plan: The security plan contains:

- List of prohibitions
- SOP
- Instructions

3.5.2 Procedures:

- Behaviors
- Alcohol test
- Drugs Test
- Escorting
- Zoning
- Human Resources Responsibilities
- Entry and exit
- Incident reporting
- Badge Request
- Self-Assessment

3.5.3 Program

Conduct strong program to demonstrate the road map.

3.6 Lesson Learn

1. Integrate HRP early into Operations
2. Create a reliability program from the beginning, if not, late start better than not to start at all
3. Lead by Example: The top management level and nuclear security staff must lead by example
4. Awareness Training
5. Frequent Background Checks
6. Live with Policy and Procedures, while assess, review, and update when needed
7. Expect great resistance, pressure from anywhere but stick to your Policies & Procedures
8. Two-Person Rules/Personnel in the Area
9. Enhance detection, delay, and response system for the insider threats in addition to what are expected of external threats
10. The effectiveness of the safety and the security measure is enhanced under a “vigilant and questioning”
11. Continuous vigilance: Intentions are covert and cannot inferred
12. Permanent attention to the Disgruntled Worker, usually have implications:
 - Inattention in training and meetings
 - Frequent angry outbursts
 - Damage occurs intentionally
 - Physical attacks on other workers or supervisors
 - Defying senior management

3.6 Challenges

Where the first and greatest challenge was considered the culture of the state and the culture of the community, in terms of:

- In our community everyone expects that trust should be present until the opposite is proven
- Just simply thinking of going to a psychiatrist is absolutely unacceptable and the existing culture considers that dealing with the Psychologist means that psychological problems (crazy) already exist
- State regulations in applying drug screening to the staff of nuclear facilities, in that the system and instructions (Law) are not allowed to take this action, which is done only by the concerned authorities in the state
- Drug test: In addition to establishing the accusation or the charge of those who test Positive without reference to a detailed history medication use (which may be a determining factor leading to positive results of drug abuse) and to certain medications or certain types of legal medical drugs (which may be used as a medical uses).

3.7 Conclusion

- Now, the Jordanian experience in the reliability program can be measured as a very successful program and helped to reduce and mitigate the internal threats to nuclear facilities (but certainly not eliminate them)
- Insider threats also take into account unintentional errors, therefore the HRP has not only focused on security screening and clearance procedures, alcohol testing, drug testing and psychiatric testing, it has also helped in the localization of competencies in the nuclear facilities .
- In addition, the Reliability Program has fundamentally changed the culture in the nuclear facilities (community, Visitors, contractors and consultants)
- Most importantly, the HRP has expanded the concept of reliability and trustworthiness for all stakeholder institutions with the nuclear program and anchoring the saying “the right man concept in the right place”.
- To reduce consequences of External Security Threats:
 1. All Plan, Program and Procedures must evolve continuously
 2. Training of Security Staff
 3. Periodic Evaluations, Audits, & Assessments
 4. Security Drills
 5. Vigilant Awareness of Potential Threats
 6. Timely Deployment of New Measures
- To ensure Mitigation of Insider Threat, we must consider that the human element in the nuclear facility is a time bomb that must be taken and trained, sensitized, educated and constantly monitored, under an effective reliability program.

REFERENCES

- [1] JRTR Physical Security Plan
- [2] JRTR Human Reliability Program
- [3] Instructions on the HRP for the workers in nuclear facilities in (2015), issued by EMRC