

# **NUCLEAR SECURITY AND CPPNM RECOMMENDATIONS - IMPLEMENTATION PERSPECTIVE**

**S. QURESHI**

**IIT KANPUR INDIA**

**QURESHI@IITK.AC.IN**



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# 1. INTRODUCTION

- **INCIDENT AND TRAFFICKING DATA BASE ( ITDB ) FACT SHEET 2016**
- **2889 INCIDENTS OF ILLICIT TRAFFICKING , THEFTS, LOSSES, UNLAWFUL ACTIVITIES SINCE 1993**
- **454 INCIDENTS OF UNAUTHORIZED POSSESSION OF NUCLEAR / RADIOACTIVE MATERIAL**
- **762 INCIDENTS INVOLVED THEFTS OR LOSSES**
- **1622 INCIDENTS INVOLVED OTHER UNAUTHORIZED ACTIVITIES**
- **13 INCIDENTS INVOLVED HEU, 3 CASES PU, AND 5 CASES PU-BE NEUTRON SOURCES**
- **MORE THAN 30 CASES WERE REPORTED BETWEEN 2013 - 2015**
- **ITDB REPORT CLEAR DEMONSTRATION OF ILLICIT TRAFFICKING, THEFTS, LOSSES , UNAUTHORIZED ACTIVITY**
- **AMENDED CPPNM CAME INTO FORCE ON 8 MAY 2016**

## 2. HISTORICAL PERSPECTIVE

- **FIRST CPPNM**
- **FIRST CPPNM OPENED FOR SIGNATURES ON 3 MARCH 1980**
- **SALIENT FEATURES OF CPPNM:**
- **RECOGNIZED RIGHT OF ALL STATES TO DEVELOP AND APPLY NUCLEAR ENERGY FOR PEACEFUL PURPOSES**
- **CONVINCED OF NEED TO FACILITATE CO-OPERATION IN PEACEFUL APPLICATION OF NUCLEAR ENERGY**
- **DESIRING TO AVERT POTENTIAL DANGERS POSED BY UNLAWFUL TAKING AND USE OF NUCLEAR MATERIAL**
- **CONVINCED THAT OFFENCES RELATING TO NUCLEAR MATERIAL ARE A MATTER OF GRAVE CONCERN AND THERE IS URGENT NEED TO ADOPT EFFECTIVE MEASURES TO ENSURE PREVENTION, DETECTION AND PUNISHMENT**
- **STRESSING IMPORTANCE OF PHYSICAL PROTECTION OF NUCLEAR MATERIAL IN DOMESTIC USE, STORAGE AND TRANSPORT**

## **2. HISTORICAL PERSPECTIVE**

- **AMENDED CPPNM**
- **DIPLOMATIC CONFERENCE WAS CONVENED IN 2005**
- **SALIENT FEATURES OF AMENDED CPPNM:**
- **RECOGNIZED RIGHT OF ALL STATES TO DEVELOP AND APPLY NUCLEAR ENERGY FOR PEACEFUL PURPOSES**
- **NEED TO FACILITATE INTERNATIONAL CO-OPERATION AND TRANSFER OF NUCLEAR TECHNOLOGY FOR PEACEFUL APPLICATIONS OF NUCLEAR ENERGY**
- **BEARING IN MIND PHYSICAL PROTECTION IS OF VITAL IMPORTANCE FOR PROTECTION OF PUBLIC HEALTH, SAFETY, ENVIRONMENT, NATIONAL AND INTERNATIONAL SECURITY**
- **DESIRING TO AVERT POTENTIAL DANGERS POSED BY ILLICIT TRAFFICKING , UNLAWFUL TAKING AND USE OF NUCLEAR MATERIAL AND SABOTAGE OF NUCLEAR MATERIAL AND NUCLEAR FACILITIES, PHYSICAL PROTECTION HAS BECOME A MATTER OF NATIONAL AND INTERNATIONAL CONCERN**

## 2. HISTORICAL PERSPECTIVE

- **AMENDED CPPNM (CONT)**
- **BELIEVING THAT PHYSICAL PROTECTION PLAYS IMPORTANT ROLE IN SUPPORTING NUCLEAR NON-PROLIFERATION AND COUNTER-TERRORISM OBJECTIVES**
- **DESIRING THROUGH THIS CONVENTION TO CONTRIBUTE TO STRENGTHENING WORLDWIDE PHYSICAL PROTECTION OF NUCLEAR MATERIAL AND NUCLEAR FACILITIES USED FOR PEACEFUL PURPOSES**
- **CONVINCED THAT OFFENCES RELATING TO NUCLEAR MATERIAL AND NUCLEAR FACILITIES ARE A MATTER OF GRAVE CONCERN AND THERE IS URGENT NEED TO ADOPT APPROPRIATE AND EFFECTIVE MEASURES FOR PHYSICAL PROTECTION OF NUCLEAR MATERIAL AND FACILITIES USED FOR PEACEFUL PURPOSES**
- **RECOGNIZING THAT THERE ARE INTERNATIONALLY FORMULATED PHYSICAL PROTECTION RECOMMENDATIONS THAT ARE UPDATED FROM TIME TO TIME WHICH CAN PROVIDE GUIDANCE ON CONTEMPORARY MEANS OF ACHIEVING EFFECTIVE LEVELS OF PHYSICAL PROTECTION**

# AMENDED CPPNM

- **AMENDED CPPNM MADE IT BINDING FOR STATES TO PROTECT NUCLEAR FACILITIES AND NUCLEAR MATERIAL IN PEACEFUL DOMESTIC USE, STORAGE AS WELL AS TRANSPORT**
- **PROVIDED FOR EXPANDED CO-OPERATION BETWEEN AND AMONG STATES TO LOCATE AND RECOVER STOLEN OR SMUGGLED NUCLEAR MATERIAL**
- **MITIGATE ANY RADIOLOGICAL CONSEQUENCES OF SABOTAGE AND PREVENT AND COMBAT RELATED OFFENSES**
- **AMENDMENT ENTERED INTO FORCE AFTER RATIFICATION BY TWO-THIRDS OF STATES PARTIES TO THE CONVENTION**

### **3. ELEMENTS OF PHYSICAL PROTECTION REGIME**

- **PHYSICAL PROTECTION REGIME IS ESSENTIAL COMPONENT OF STATE'S NUCLEAR SECURITY REGIME**
- **PROTECT AGAINST UNAUTHORIZED REMOVAL OF NUCLEAR MATERIAL**
- **LOCATE AND RECOVER MISSING MATERIAL**
- **PROTECT AGAINST SABOTAGE**
- **MITIGATE OR MINIMIZE EFFECTS OF SABOTAGE**

# 3. IAEA'S ROLE IN DEVELOPING PHYSICAL PROTECTION REGIME

- **ACTIVELY WORK ON DISSEMINATION OF INFORMATION THROUGH**
- **EXPERT MISSIONS**
- **WORKSHOPS**
- **TRAINING COURSES**
- **SUPPORT THROUGH IPPAS MISSIONS**
- **BRING ABOUT COMMON UNDERSTANDING IN REGULATING, IMPLEMENTING AND SUSTAINING PHYSICAL PROTECTION REGIME**



## 3.1 STATE RESPONSIBILITY

- **RESPONSIBILITY FOR ESTABLISHMENT AND MAINTENANCE OF PHYSICAL PROTECTION REGIME WITHIN A STATE RESTS ENTIRELY WITH THE STATE (FUNDAMENTAL PRINCIPAL A)**
- **STATE'S PHYSICAL PROTECTION REGIME IS INTENDED FOR ALL MATERIAL IN USE AND STORAGE AND DURING TRANSPORT FOR ALL NUCLEAR FACILITIES**
- **STATE SHOULD ENSURE PROTECTION OF NUCLEAR MATERIAL AND NUCLEAR FACILITIES AGAINST UNAUTHORIZED REMOVAL AND AGAINST SABOTAGE**
- **STATES NUCLEAR PROTECTION REGIME SHOULD BE REVIEWED AND UPDATED TO REFLECT CHANGES IN THREAT AND ADVANCES MADE IN PHYSICAL PROTECTION APPROACHES, SYSTEMS AND NEW TYPES OF MATERIALS AND FACILITIES**

## 3.2 INTERNATIONAL TRANSPORT

- **RESPONSIBILITY OF STATE FOR ENSURING NUCLEAR MATERIAL IS ADEQUATELY PROTECTED EXTENDS TO INTERNATIONAL TRANSPORT UNTIL RESPONSIBILITY IS PROPERLY TRANSFERRED TO ANOTHER STATE (FUNDAMENTAL PRINCIPLE B)**
- **STATES'S RESPONSIBILITY FOR PHYSICAL PROTECTION IS DETERMINED BY BORDERS OF ITS SOVEREIGN TERRITORY OR FLAG OF REGISTRATION OF TRANSPORT VESSEL OR AIRCRAFT.**
- **STATE'S PHYSICAL PROTECTION REGIME FOR NUCLEAR MATERIAL IN INTERNATIONAL TRANSPORT EXTENDS TO CARRIAGE OF MATERIAL ON BOARD SHIPS OR AIRCRAFT REGISTERED TO STATE UNTIL RECEIVING STATE ACQUIRES JURISDICTION**
- **STATES PHYSICAL PROTECTION REGIME SHOULD ENSURE NUCLEAR MATERIAL IS ALWAYS UNDER JURISDICTION AND CONTROL OF STATE AND RESPONSIBILITY FOR PHYSICAL PROTECTION IS TRANSFERRED FROM ONE STATE TO ANOTHER IS CLEARLY DEFINED**

## 3.3 LEGISLATIVE AND REGULATORY FRAMEWORK

- **STATE IS RESPONSIBLE FOR ESTABLISHING AND MAINTAINING A LEGISLATIVE FRAMEWORK TO GOVERN PHYSICAL PROTECTION. FRAMEWORK SHOULD PROVIDE FOR ESTABLISHMENT OF PHYSICAL PROTECTION REQUIREMENTS, SYSTEM OF EVALUATION AND LICENSING (FUNDAMENTAL PRINCIPLE C)**
- **STATE SHOULD TAKE APPROPRIATE MEASURES WITHIN THE FRAMEWORK OF ITS NATIONAL LAW TO ESTABLISH AND ENSURE PROPER IMPLEMENTATION OF ITS PHYSICAL PROTECTION REGIME**
- **STATE SHOULD DEFINE REQUIREMENTS FOR PHYSICAL PROTECTION OF MATERIAL IN USE, IN STORAGE AND DURING TRANSPORT AND FOR NUCLEAR FACILITIES**
- **STATE'S LEGISLATION SHOULD PROVIDE FOR COMPREHENSIVE REGULATION OF PHYSICAL PROTECTION AND INCLUDE REQUIREMENTS TO GRANT AUTHORIZATION.**
- **STATE SHOULD ESTABLISH AND DESIGNATE COMPETENT AUTHORITY RESPONSIBLE FOR IMPLEMENTATION OF LEGISLATIVE AND REGULATORY FRAMEWORK**

## **3.3.1 AREAS OF CONCERN WITH REGARD TO REGULATORY FRAMEWORK IN COUNTRIES PRODUCING NATURAL URANIUM**

- **SOME STATES PRODUCE SIGNIFICANT AMOUNTS OF NATURAL URANIUM ORE CONCENTRATE AT MULTIPLE SITES AND ESTABLISHMENT OF COMPREHENSIVE SYSTEM FOR CONTROL AND PHYSICAL PROTECTION IS A CHALLENGE**
- **ADEQUATE FRAMEWORK IS REQUIRED TO ENSURE PHYSICAL PROTECTION**
- **PARTICULARLY OF CONCERN IS MINING AND EXTRACTION DONE AT MULTIPLE SITES**
- **PROTECTION OF URANIUM ORE CONCENTRATE (UOC) POSES A KEY CHALLENGE**
- **LIMITED INTERNATIONAL GUIDANCE AVAILABLE WHICH IS APPLICABLE TO UOC**
- **IAEA SERIES “NUCLEAR SECURITY IN URANIUM EXTRACTION INDUSTRY” PROVIDES SOME GUIDANCE**

## **3.3.2 AREA OF CONCERN WITH REGARD TO ROLE OF LICENSE HOLDERS IN CASE OF ACCIDENT**

- **RESPONSIBILITY FOR IMPLEMENTING VARIOUS ELEMENTS OF PHYSICAL PROTECTION WITHIN A STATE SHOULD BE CLEARLY DEFINED. STATE SHOULD ENSURE PRIME RESPONSIBILITY FOR IMPLEMENTATION OF PHYSICAL PROTECTION RESTS WITH LICENSE HOLDERS OF RELEVANT LICENSES ( FUNDAMENTAL PRINCIPLE E )**
- **ADEQUATE ROLE AND RESPONSIBILITY OF LICENSE HOLDER WITH REGARD TO PHYSICAL PROTECTION IS CLEARLY SPECIFIED IN CASE OF NORMAL OPERATION**
- **NO CLEAR AND UNAMBIGUOUS GUIDELINES EXIST ON THE ROLE OF LICENSE HOLDER IN CASE OF ACCIDENT. ACCIDENTS HAPPEN PARTICULARLY IN TRANSPORT OF NUCLEAR MATERIAL**
- **BESIDES HEALTH AND ENVIRONMENT HAZARD IT COMES WITH RISK OF NUCLEAR MATERIAL FALLING IN HANDS OF ACTORS WITH MALICIOUS INTENT**
- **LIMITED INCIDENTS LIKE TRUCK OR SHIP FIRE CARRYING NUCLEAR MATERIAL HAVE BEEN REPORTED**

### **3.3.3 AREA OF CONCERN WITH REGARD TO REGULATORY FRAMEWORK IN COUNTRIES HAVING RESEARCH REACTORS**

- **ACCORDING TO WORLD NUCLEAR ASSOCIATION 45 COUNTRIES HAVE NUCLEAR POWER PLANTS OR PLANS TO HAVE THEM. SOME FORM OF REGULATORY FRAMEWORK IS IN PLACE.**
- **STATE WITH RESEARCH REACTOR MAY NOT HAVE ADEQUATE REGULATORY FRAMEWORK FOR PHYSICAL PROTECTION OF NUCLEAR AND RADIOACTIVE MATERIAL.**
- **SOME NUCLEAR SECURITY ANALYSIS STUDIES HAVE SHOWN RESEARCH REACTORS ARE WEAKLY PROTECTED**
- **MANY RESEARCH REACTORS USE HIGHLY ENRICHED FUEL THOUGH BEING REPLACED WITH LEU FUEL**
- **RESEARCH REACTORS TEND TO BE LOCATED IN POPULATED AREAS**
- **ROLE OF IAEA ASSUMES IMPORTANCE WHEN IT COMES TO STRENGTHENING OF REGULATORY FRAMEWORK**

## 3.3.4 AREA OF CONCERN WITH REGARD TO SECURITY OF RADIOACTIVE SOURCES

- **RADIOACTIVE SOURCES ARE WIDELY USED IN INDUSTRIAL APPLICATIONS AND IN DIAGNOSIS AND TREATMENT. MALICIOUS ACT CAN INVOLVE UNAUTHORIZED REMOVAL OF SOURCE.**
- **DESPITE REGULATORY GUIDANCE RADIOACTIVE MATERIAL LIKE CS-137 IS STILL USED IN FORM OF SALT WHICH IS WATER SOLUBLE AND CAN CONTAMINATE LARGE VOLUMES OF WATER**
- **LARGE NUMBER OF SOURCES STILL IN USE**
- **AGGREGATION OF SOURCES FOR MALICIOUS ACT CAN POSE A THREAT**

## 3.3.5 AREA OF CONCERN WITH REGARD TO COMPUTER SECURITY

- **COMPUTER TECHNOLOGY IS BEING INCREASINGLY USED FOR VITAL FUNCTIONS OF NUCLEAR FACILITY. INCLUDES OPERATION OF CONTROL SYSTEMS, ACCESS CONTROL SYSTEMS, ALARM AND TRACKING SYSTEMS, INFORMATION SYSTEMS PERTAINING TO SAFETY AND EMERGENCY RESPONSE**
- **COMPUTER SYSTEMS ARE SUSCEPTIBLE TO SUBOTAGE**
- **ADVERSARY CAN CARRY OUT MALICIOUS ACT WHILE LOCATED OUTSIDE THE BOUNDARIES OF A STATE.**
- **INCIDENTS RELATED TO HUMAN ERROR HAVE BEEN REPORTED**
- **A ROBUST COMPUTER SECURITY CULTURE IS ESSENTIAL COMPONENT OF COMPUTER SECURITY**
- **STRONG COMPUTER SECURITY TRAINING PROGRAMME SHOULD BE PART OF SECURITY CULTURE**



## 4. WAY FORWARD

- **WHILE IAEA IS PLAYING A CENTRAL AND ESSENTIAL ROLE IN ASSISTING STATES , ULTIMATE RESPONSIBILITY OF ENSURING PHYSICAL PROTECTION OF NUCLEAR MATERIAL AND FACILITIES LIES WITH THE STATES INCLUDING STRENGTHENING OF REGULATING FRAMEWORK. FURTHER STRONG AND TECHNICALLY COMPETENT REGULATORS ARE NECESSARY TO ENSURE GUIDELINES ARE WELL UNDERSTOOD, FOLLOWED AND ENFORCED .**
- **SECURITY BE PROMOTED ALONG SIDE SAFETY AND NOT TREATED SECONDARY TO SAFETY**
- **EQUAL IMPORTANCE BE GIVEN IN PROMOTING SECURITY AND SAFETY CULTURE.**
- **REGULATORY FRAMEWORK SHOULD WORK TOWARDS CREATING HARMONY BETWEEN SECURITY AND SAFETY**
- **SECURITY IMPLEMENTATION FAILURES DO NOT RECOGNIZE BORDERS HENCE A MECHANISM FOR PERIODIC EVALUATION OF NUCLEAR SECURITY MAY BE NEGOTIATED**

# REFERENCES

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**THANK YOU !!!**