Non- medical Exposure
X-ray security control of persons
Czech Approach

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IAEA TM on Non-medical Exposure, January 2017
State Office for Nuclear Safety (SUJB) is independent body under Czech Government with competence to prepare own legislation, SUJB is only one regulatory body in the field of radiation protection (only for some aspects of medical exposure is responsible Ministry of Health)


New Decree on Radiation Protection adopted in December 2016 as Decree No.422/2016 Coll.
Legislation

Non – Medical Exposure

Atomic Law

- strict requirement for justification
- definition of 2 types of non-medical exposure
  1. using radiological equipment in medical facility
  2. using other source
Non – Medical Exposure

Ad 1. the same requirements as for medical exposure shall be kept as far as possible, requirements for low dose techniques, reflecting health status of examined person, examination shall be registered (details of registration given by Decree)
Non – Medical Exposure

Ad 2. when using other source then radiological equipment the dose constraint shall be respected, examination shall be recorded (details of record given by Decree)
Legislation

Non – Medical Exposure

Ad 1 and 2. exposed person shall be informed about the risk and other relevant aspects of examination and shall agree with examination

(only exception can be if there is a suspicion for criminal act and examination is required by prosecutor)
Current Situation

Non – Medical Exposure

Based on the national survey the extent of non – medical exposures in the Czech Republic is very small.

In fact there were no identified examinations performed with radiological equipment without a specific document signed by physician (referrer) or requested by prosecutor – the cases when customs officers have a serious suspicion for drug smuggling inside of human body – tens cases per year.)
Current Situation

Non – Medical Exposure

Czech customs officers use also high voltage X-ray machine for control of trucks searching an illegally transported goods, altogether they have found 34 illegally transported persons during 8 years of use since 2016 they have a new machine Nuctech
X-ray human scanners

- X-ray whole body scanners are not used in the Czech Republic at the moment

**BUT**

- Currently there are five companies in the Czech Republic distributing sources which have got the type approval for X-ray machines – whole body scanners (using backscatter) – for personal security control.
- SUJB in the case of these scanners used its power given by legislation and categorised this devices for non medical human imaging as **sources needed always authorisation – license for their use (note – this was done in 2007)**
X-rays human scanners

- All kind of such devices are thus under the regulation and control - **regardless of very low doses** (around 0.1 µSv per scan) – what is very often incorrectly used as a main argument for wide use of them.
- Based on this fact one of the conditions of its type approval requires to inform the potential users of such device that they **shall apply for the license** of SUJB.
- The applicant for the license has to prepare all necessary documentation including the **justification of the use of the source**.
Criteria/Conditions

SUJB set up the following criteria for the evaluation of the individual applications for approval:

- the particular use of body scanner will be justified and optimized,
- the control will be focused only to the selected (suspicious) persons – it will not be in any case used as a routine control,
- there will be set up an age limit of controled persons,
- the exposure is understood as a public exposure and thus the limit of 1mSv shall be applied, SUJB establishes a dose constraint for the exposure from this particular source 150 μSv per year,
Criteria/Conditions

- controlled persons will be **informed** by the licensee about:
  - the dose they can receive during one control and the related risk
  - the annual dose (dose constraint) which one person can receive in one year
- a controlled person must have a **right to refuse** a control with a body scanner and pass an alternative control without using an ionizing radiation
- **pregnant women** shall not be asked to pass this kind of control (however this implies that each woman practically can be excluded) – here we took into account mainly the possible psychological impact

Seeing these conditions it can be stated that there is not possible to give in advance and generally approval for the use of whole-body scanners.

It will depend on the particular conditions of their use.
Justification

What information, facts, parameters shall be included in the process of justification and optimization in this particular use of sources of ionizing radiation?

During the discussion with distributing companies and potential users there was clearly visible that justification from the radiation protection point of view is understood by them quite incorrectly as a very narrow view taking into account only estimated individual doses.
Justification

They used often the argument – „the individual doses are trivial so the exposure is justified“ (!). To explain them that, even trivial doses but not clearly justified by the net benefit taking into account economical and societal aspects cannot be accepted, was very difficult and almost impossible.

However to identify and correctly weight all aspects in this very specific use of ionizing radiation is very difficult. Societal aspects as the level of protection of human dignity, personality, etc.. is difficult to specify generally and the sensitivity to the invasion of these human rights vary from person to person.
Also the evaluation of the current threats could be very difficult and depending on many circumstances, interests, pressures, personal points of view, politics, etc..
Nevertheless SUJB has got in 2009 a first official request from one airport in the country for the approval of the use of X-ray machine for security control of persons.

- SUJB organized a discussion on the national level inviting the representatives of other ministries and offices somehow involved in this problem - Ministry of Health, Ministry of Interior, Ministry of Transport – Civil Aviation Department, the Office for personal data protection, the Civil Aviation Authority.
- Based on this discussion and further analyses the answer of SUJB was at that moment negative.
Explanatory statement – published on SUJB web side

The use of X-ray for personal security control is understood as unjustified under current circumstances and from the point of view of radiation protection.

The important arguments influencing the decision were that

- the current security situation in the country doesn´t show the elevated threat justifying the use of such technique for security control of persons
- alternative techniques which enable a surface body control of persons and which can identify “suspicious” objects on the body exist and they are effective enough (microwaves, infra-waves detectors).

This conclusion was also sent by president of SUJB to Minister of Interior and to Prime Minister.
Europe

The use of body scanners at the airports is influenced also by the fact that current EU legislation doesn’t allow at the moment the use of such security control of persons at the airports – there was only a kind of pilot project testing the use of these devices at selected European airports – however at the end of 2008 there was a discussion initiated by some European representatives focused mainly on the ethical aspects of the use of such devices.

This initiative led to the public consultation. Then discussion DG ENER,DG MOVE and DG SANCO. Since 2011 it is prohibited by EC to use X-ray scanners at the European airports.
TSA Removes X-Ray Body Scanners from Airports (2013)

The Transportation Security Administration will remove all X-ray body scanners from airports, Bloomberg News reports. The reason: Software couldn't be developed by a congressionally mandated deadline to automatically detect suspicious items on the body. Instead, TSA officers viewed images of passengers' naked bodies to see if they were carrying weapons or other contraband, a process that privacy advocates have dubbed a "virtual strip search."

Privacy had not been the only concern dogging the scanners. A ProPublica investigation found that the TSA had glossed over the small cancer risk posed by even the low doses of radiation emitted by X-ray scanners. The stories also showed that the United States was almost alone in the world in X-raying passengers and that the Food and Drug Administration had gone against its own advisory panel, which recommended the agency set a federal safety standard for security X-rays. In addition, ProPublica reported that, outside airports, other security agencies are exposing people to radiation in more settings and in increasing doses.

The TSA also uses another, safer kind of scanner that doesn't emit X-rays. Instead, it sends out millimeter waves like those used in cell phones. Although there has been some doubt about the long-term safety of millimeter waves, scientists have not found a mechanism for such waves to mutate genes and cause cancer.

X-ray scanners could still come back. The TSA is considering an X-ray machine made by another company under a contract for the next generation of body scanners.

The last X-ray scanners in use in Europe were removed from Manchester Airport in the United Kingdom in September. Israel, which is influential in the security world, has installed an X-ray body scanner for testing at Ben Gurion Airport in Tel Aviv.
Jailhouses

- Another potential user we could see in the near future are jailhouses.
- They already are equipped with these devices in some countries and there is a positive observation of decrease in smuggling of prohibited objects.
- The use must be again authorised and the clear conditions shall be established. It must be prohibited to use the device for regular and daily control of staff and prisoners, the controlled persons must be informed and alternative technique must be available.
- This condition raise a question of availability of alternative technique in the case of direct X-ray when also the human cavities are checked.
- December 2016 – interest from Ministry of Justice – discussion on -going
ARMY

• Ministry of Defence has in the Czech Republic a competence to control the use of ionizing sources in its own facilities.
• Atomic Law is binding for this ministry.
• SUJB and MoD have a good co-operation and there was an open discussion on justification of this use of whole body scanner
• Czech Army is equipped with whole body scanner which is used mainly on some abroad missions where is installed at the entrance to the designated area and all persons entering this area are scanned for security reasons (missions use often local people for some kind of services)
Other potential users in the future???

• Sports Stadiums
• Shopping Centers
• Banks
• Strategic Buildings
• ????
Thank you for your attention