

SNF Transportation Safety & Security Concerns



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Regulations

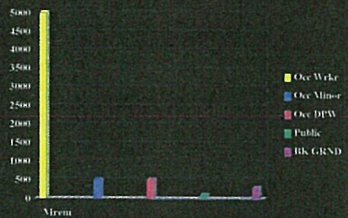
- There are three main regulating agencies
 - Department Of Energy 10 CFR
 - Department Of Transportation (FRA & PHMSA) 49 CFR
 - Department Of Labor (OSHA) 29 CFR part 19
- FRA and PHMSA regulations (train placement guide) are the only two that we routinely deal with.

Comparisons

- DOE & OSHA sets limits on radiation exposure. FRA & PHMSA do not.
- FRA and DOE set radiation levels for the shipment. OSHA & PHMSA do not.
- FRA only sets radiation levels in the cab of the locomotive.

DOE Dose limits

- Occupational Worker: 5,000 mR max
- Member Of the Public: 2 mR per hour not to exceed 100 mR per year.
- Pregnant women: 500 mR during pregnancy
- Occupational Minor: 500 mR per year



Administrative Dose Limits

- Designed to lower individual exposure as part of ALARA Principles (As Low As Reasonably Achievable)
 - Keep radioactive material segregated
 - Control access to material and spaces
 - Assign lower dose limits and measure exposure
 - Limit access to involved workers
 - Allow access only when needed to perform work
 - Establish stay times to keep dose from exceeding limits
 - Train employees in radiation safety
- DOE sets a 2,000 mR limit with a 500 mR administrative dose to their employees

We are not protected under 10 CFR

- We don't meet their definition of a worker, contractor, or employee.
- We are not considered Members Of the Public: The EIS for Yucca said our dose is OCCUPATIONAL.
- FRA allows shipments to emit more radiation than an MOP can receive (2 mR per hour, not to exceed 100 mR per year).

- This means we lose the training, Radiation Protection Program, dosimetry requirements, dose limits, pregnant worker protection, monitoring and ALARA principles that 10 CFR provides.

Occupational Safety and Health Administration

- OSHA covers employees that 10 CFR does not.
- States can have their own OSHA laws that are more stringent than Federal OSHA without preemption.

OSHA Dose Limits (29 CFR 19.1096)

- 5,000 mR / year max not to exceed 1,250 mR per quarter.
- 500 mR for minors
- **NO** pregnant Worker limit
- No right to dosimetry unless RR determined you were likely to get more than 312.5 mR per quarter

PROBLEMS

- Uses terms not applicable to RR (Restricted Area, Unrestricted Area, Radiation Area, High Radiation Area)
- Was not written to assume transportation of SNF & HLRW
- Was not written when women were in the workplace
- Allows gross overexposure
- Contains no training requirements or ALARA principles
- **CAN NOT BE ENFORCED ON RR PROPERTY EXCEPT FOR FIXED FACILITIES!!!**

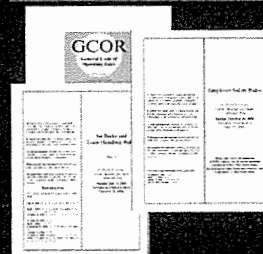
FRA limits

- FRA allows packages to emit 200 mR/hour on contact, 10 mR an hour at 1 meter.
- Exclusive use shipments may emit 1,000 mR per hour on contact, 200 mR at the plane of the car surface and 10 mR at 2 meters.
- 2 mR/hour in occupied cab or car.
- Higher if given dosimetry.

FRA does not:

- Set dose limits
- Require specific safety training
- Provide pregnant worker protection
- Require dosimetry unless dose in cab is greater than 2 mR/hour
- FRA allowances for package emissions ensure we are not Members Of the Public

Carrier Radiation Safety



The words *radiation*, *radioactive*, or *nuclear* are not found in:

- General Code of Operating Rules
- Air Brake & Train Handling
- TY&E Safety Rules
- Employee Safety Rules

Emergency response

- Response will come from local sources and may be limited in training, resources, and ability to arrive in a timely manner



Radiological concerns

- No RPP, dosimetry, DPW, ALARA, admin dose, etc.
- No dosimetry alarm on lead unit
- High offlink exposure potential for crews parked adjacent to casks, MOW, carmen
- High onlink potential during routine problems: drawbar, knuckle, triple valve, etc.

Radiological

- Dose rate on engines likely to be very small 1.5 mR in 7-12 hour days.
- Dose from load on adjacent track may be as high as 17.4 mR per hour.
- Dose on foot path may be 40 mR/hour.



Conclusions

- Crews need a determined status
- A realistic administrative dose limit
- Dosimetry
- MERRTT type training as part of a Radiation Safety Training Program
- ALARA-based RPP
- Special Locomotive Standards
- Improved communication ability
- Improved operational security



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