



**BRC and NE Task Force Meetings
Boston, October 12 & 13, 2011**

**Evaluation of Shortline Railroads
&
SNF/HLW Rail Shipment Inspections
Tasked for the Transportation of Spent Nuclear Fuel**



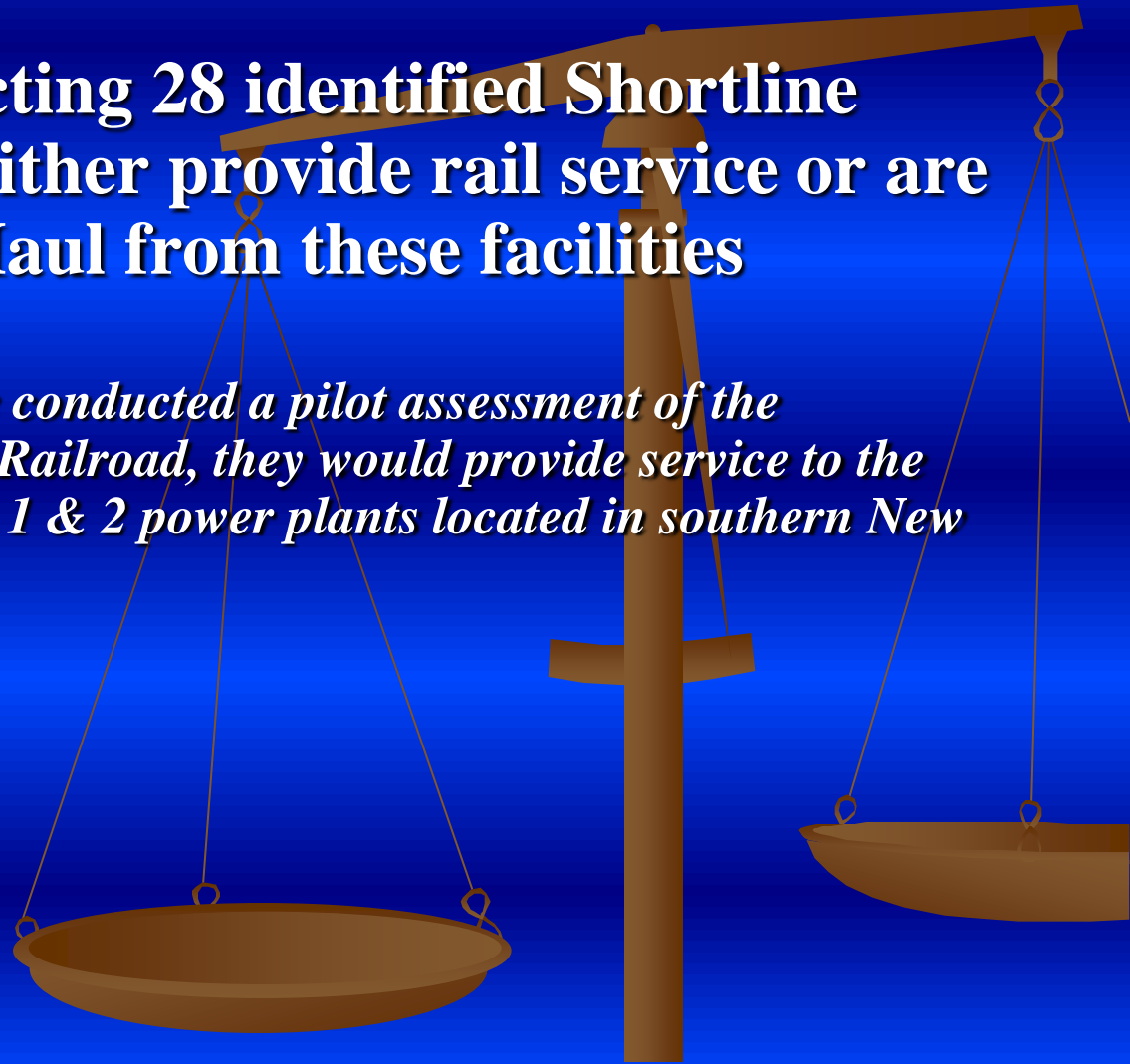
Evaluation of Shortline Railroads

- **Task:**
 - **Identify Shortline Railroads Serving Nuclear Power Plants**
 - **Establish Contact Information with Railroads Officials**
 - **Field Review of each Railroad's Physical and Operational Infrastructure**
 - **Facilitate Upgrades to Meet Safe Acceptable Standards**



Evaluation of Shortline Railroads

- **Began by contacting 28 identified Shortline Railroads that either provide rail service or are a short Heavy Haul from these facilities**
- *In September, 2007, we conducted a pilot assessment of the Winchester & Western Railroad, they would provide service to the Hope Creek and Salem 1 & 2 power plants located in southern New Jersey*



Evaluation of Shortline Railroads

- Physical and Operational Infrastructure Survey Information

TRACK INFORMATION

CLASS ONE RAILROAD CONNECTION -

CLASS of TRACK -

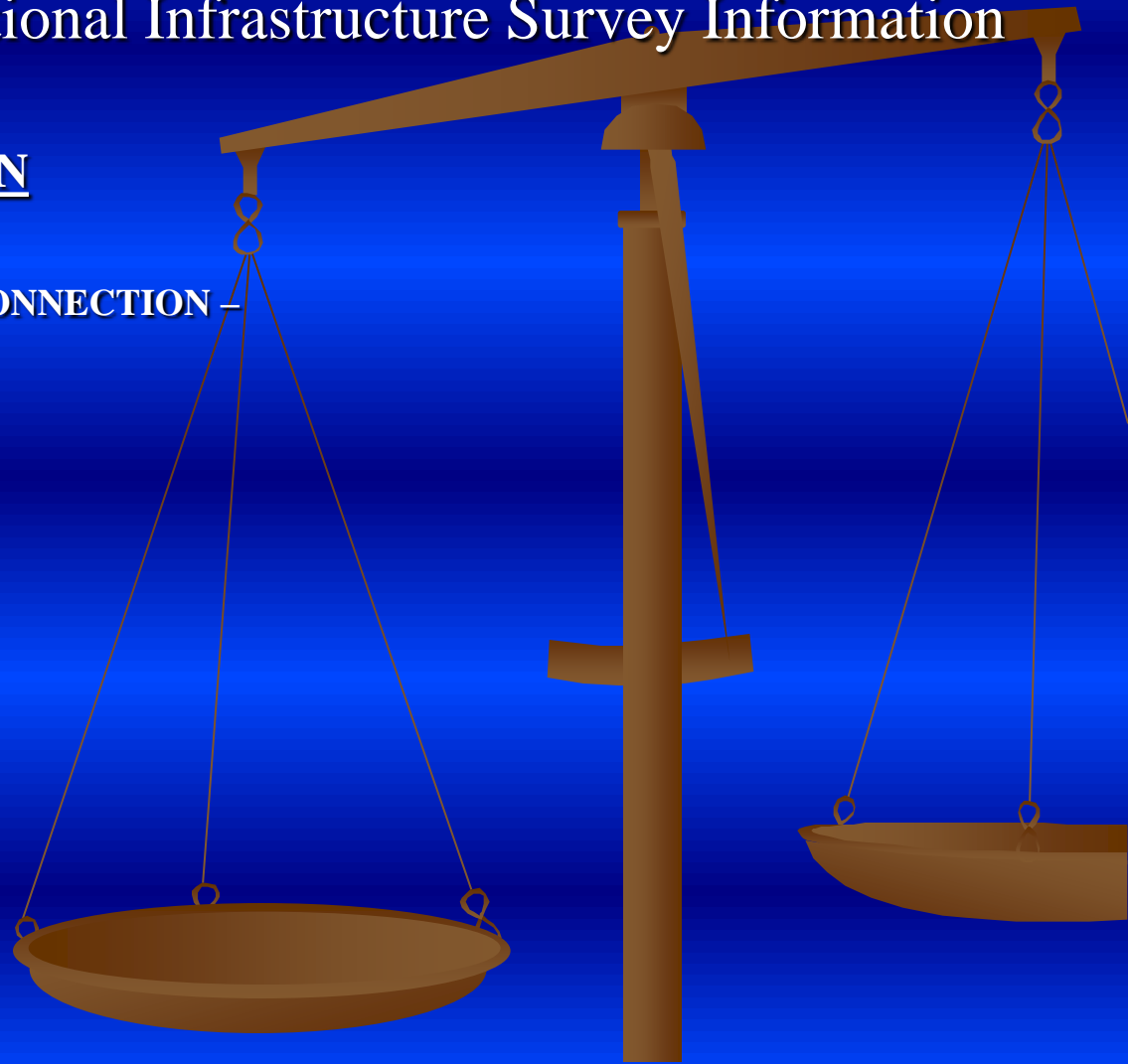
RAIL WEIGHT

≥100 LBS -

<100 LBS -

TRACK OWNERSHIP -

TRACK RESTRICTIONS -



Evaluation of Shortline Railroads

- Physical and Operational Infrastructure Survey Information

O P INFORMATION

METHOD of OPERATION –

Signaled Territory -

Dispatched -

Joint Operations -



Evaluation of Shortline Railroads

- Physical and Operational Infrastructure Survey Information

MECHANICAL INFORMATION

EQUIPMENT RESTRICTIONS -



Evaluation of Shortline Railroads

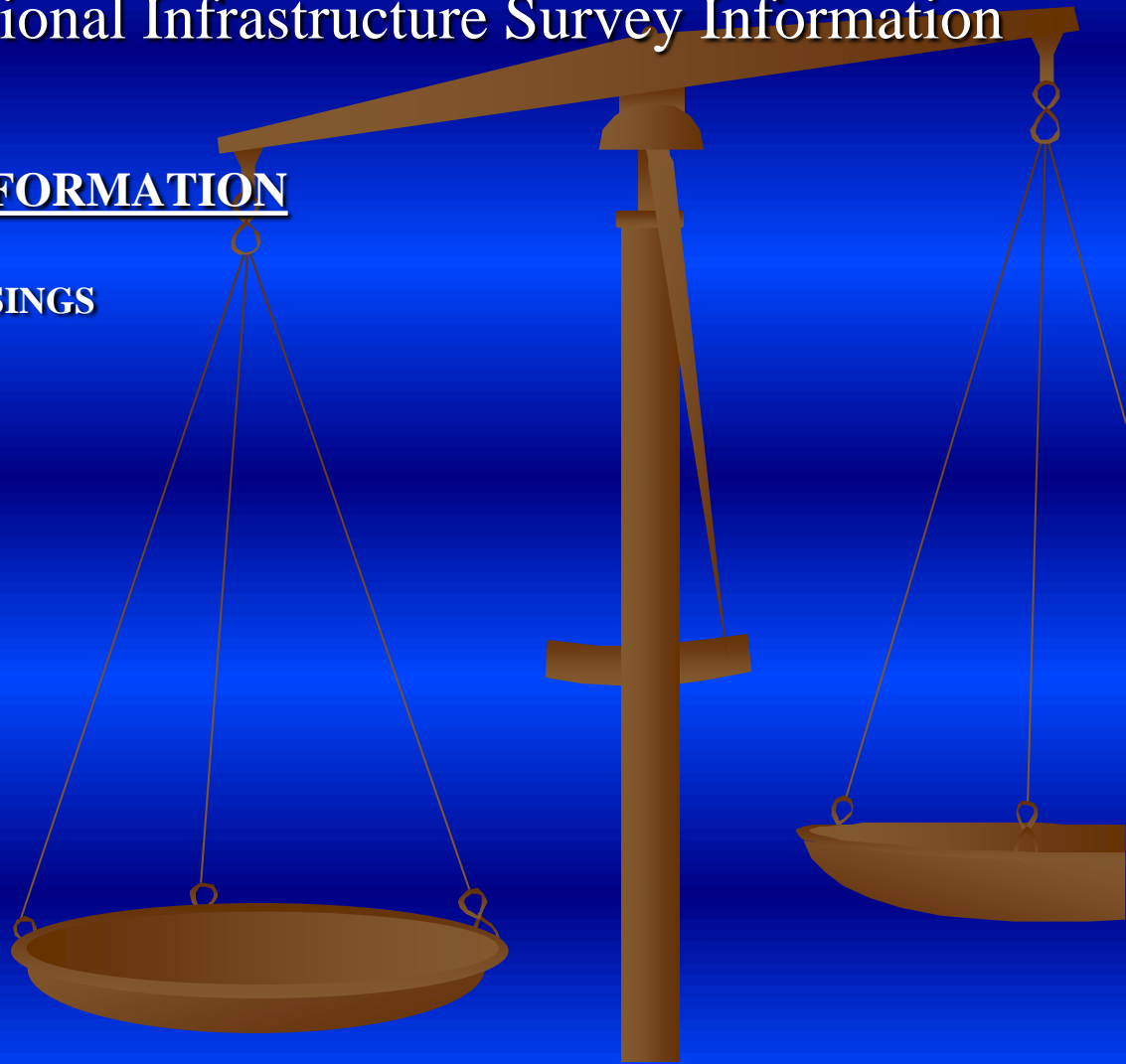
- Physical and Operational Infrastructure Survey Information

GRADE CROSSING INFORMATION

NUMBER of GRADE CROSSINGS

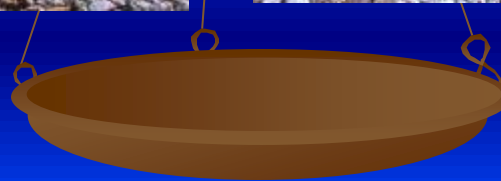
ACTIVE -

PASSIVE -



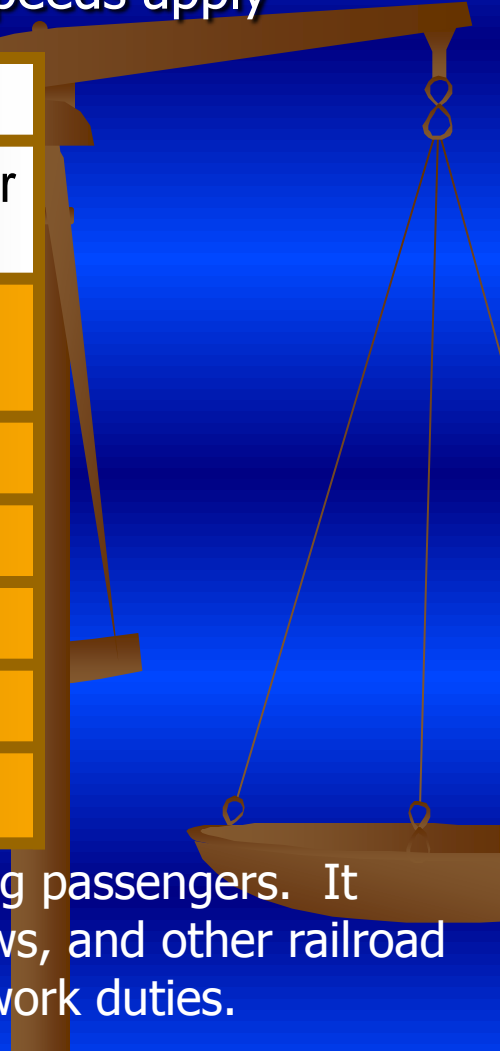
Evaluation of Shortline Railroads

CLASS 3 vs. EXCEPTED TRACK



Evaluation of Shortline Railroads

The following maximum allowable operating speeds apply

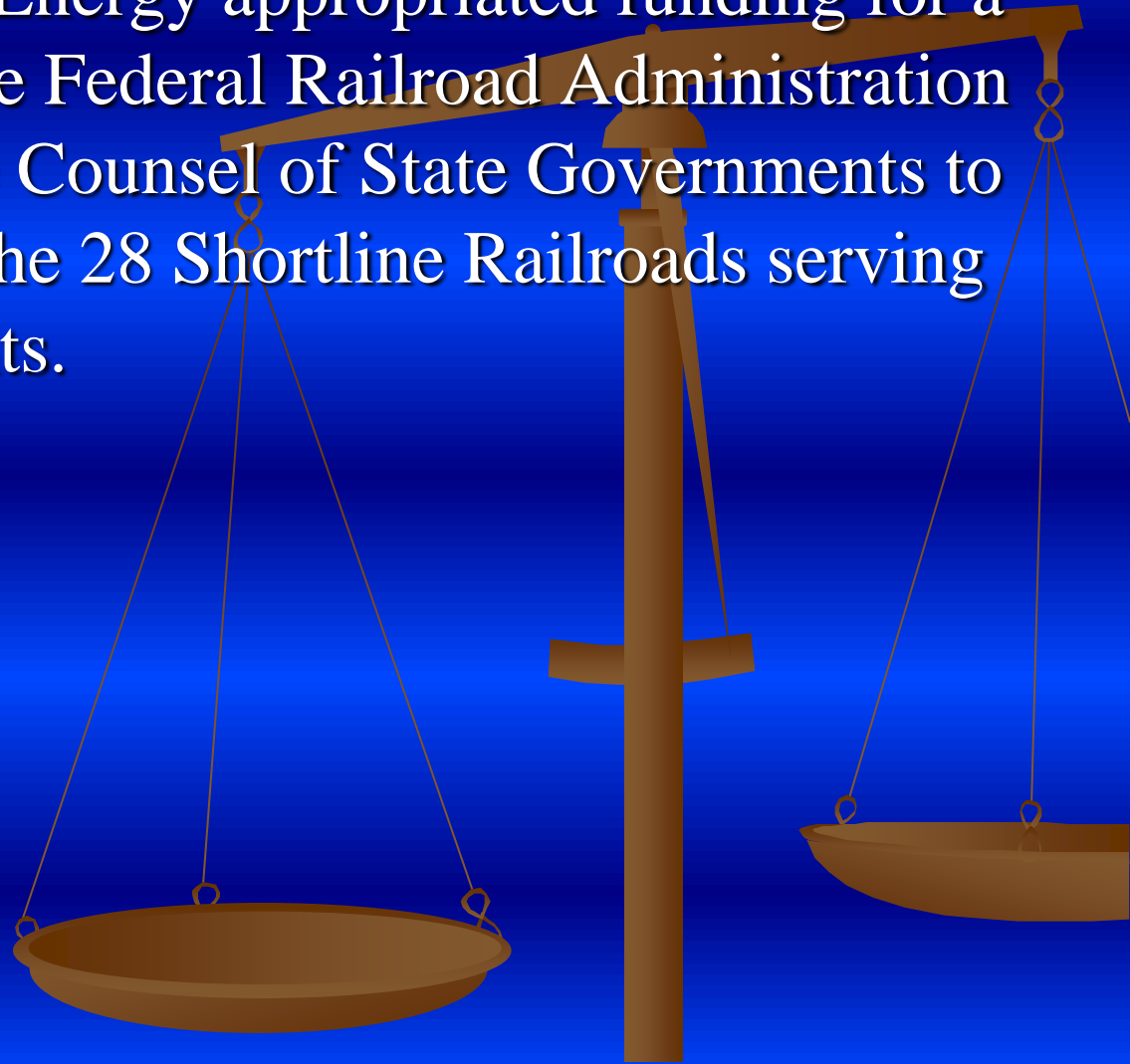


Track Class	Maximum Speed	
	Freight	Passenger
Excepted	10	N/A
1	10	15
2	25	30
3	40	60
4	60	80
5	80	90

The word "occupied" in (e)(2) refers to paying and non-paying passengers. It does not include train crew members, track maintenance crews, and other railroad employees who must travel over the track to attend to their work duties.

Evaluation of Shortline Railroads

- The Department of Energy appropriated funding for a joint project with the Federal Railroad Administration accompanied by the Counsel of State Governments to conduct a study of the 28 Shortline Railroads serving Nuclear Power Plants.

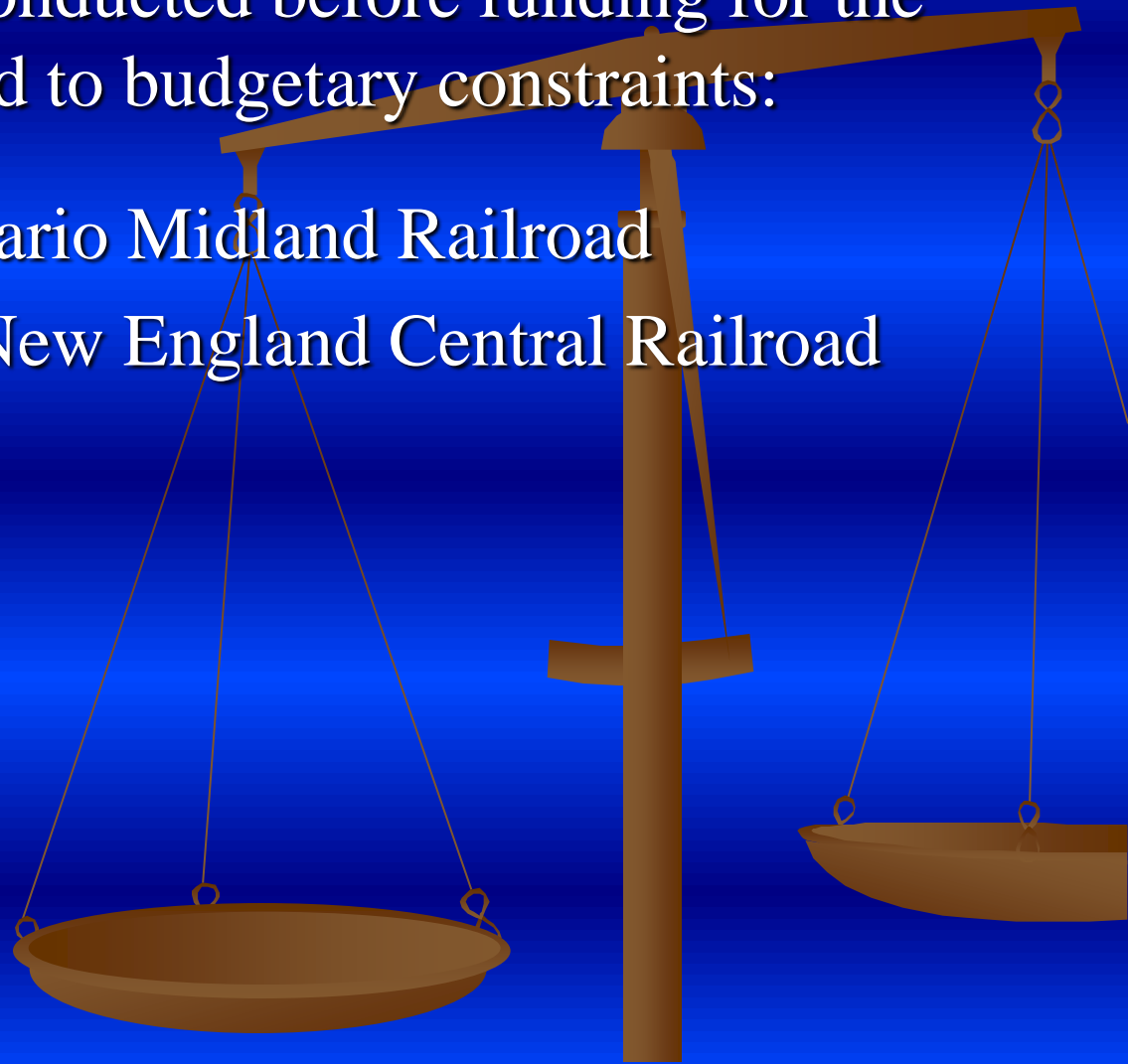


Evaluation of Shortline Railroads

- Two studies were conducted before funding for the study was suspended to budgetary constraints:

GINNA NPP/Ontario Midland Railroad

Vermont NPP/New England Central Railroad

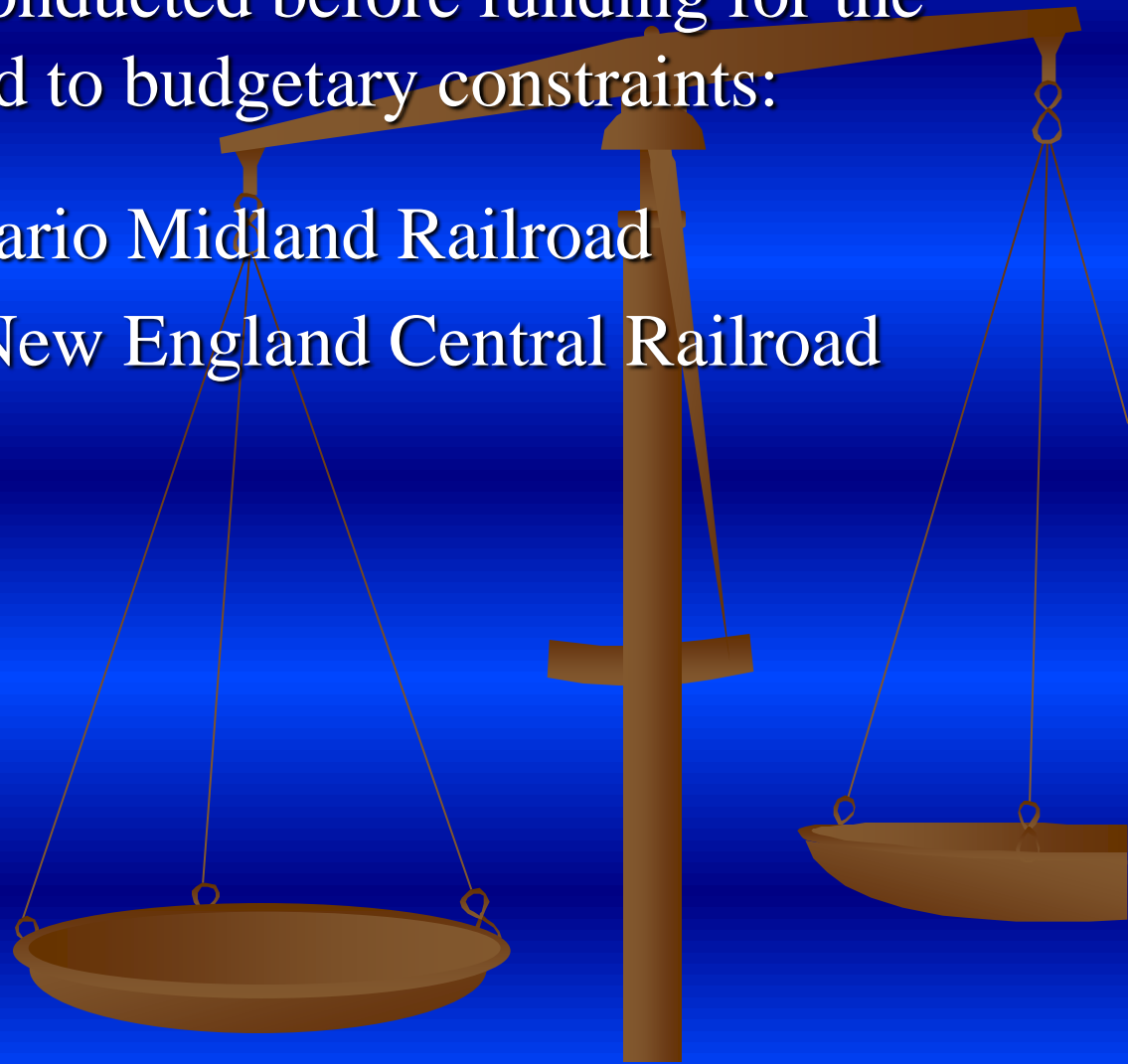


Evaluation of Shortline Railroads

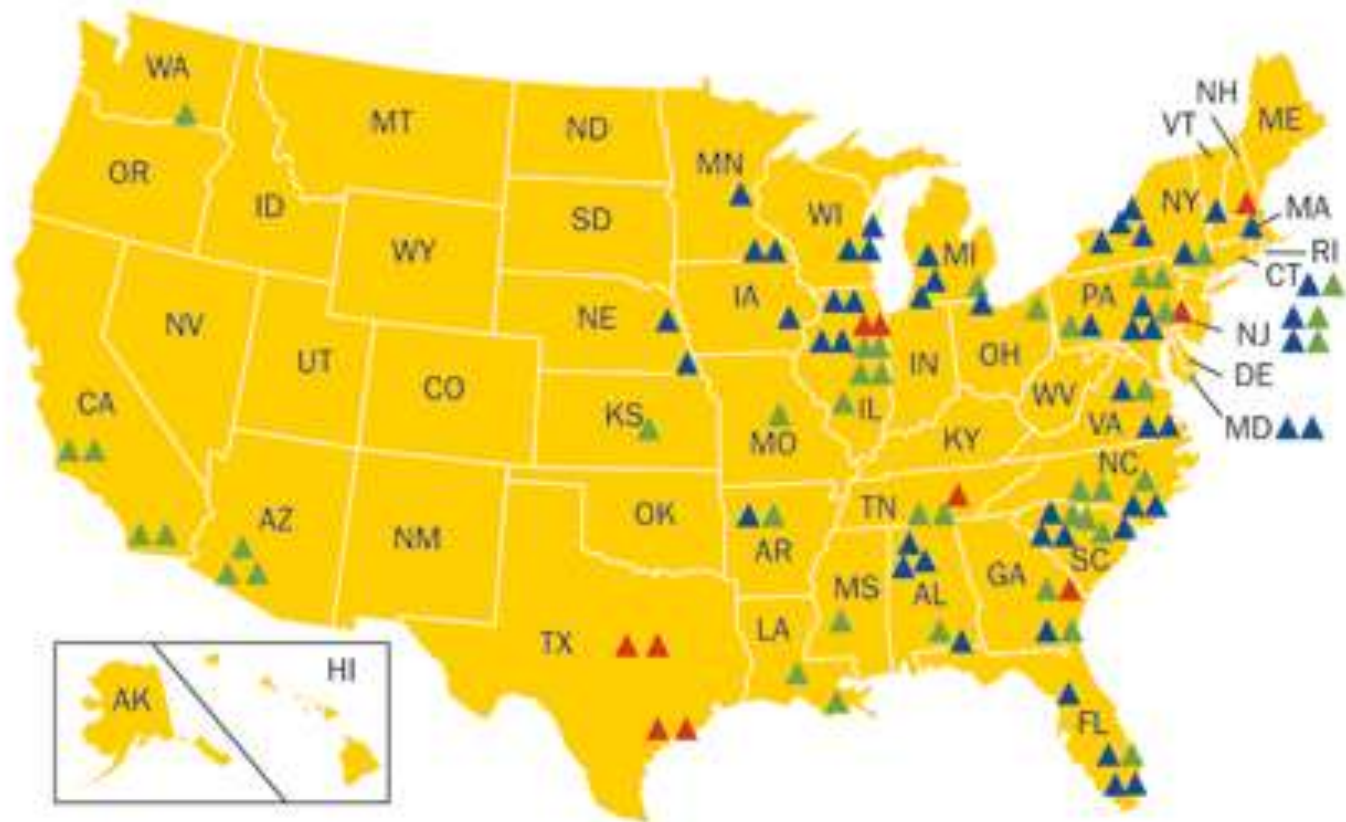
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GINNA NPP/Ontario Midland Railroad

Vermont NPP/New England Central Railroad



U.S. Commercial Nuclear Power Reactors—Years of Operation



Years of Commercial Operation

- △ 0-9
- ▲ 10-19
- ▲ 20-29
- ▲ 30-39

Number of Reactors

- 0
- 10
- 42
- 52

Source: U.S. Nuclear Regulatory Commission

Evaluation of Shortline Railroads

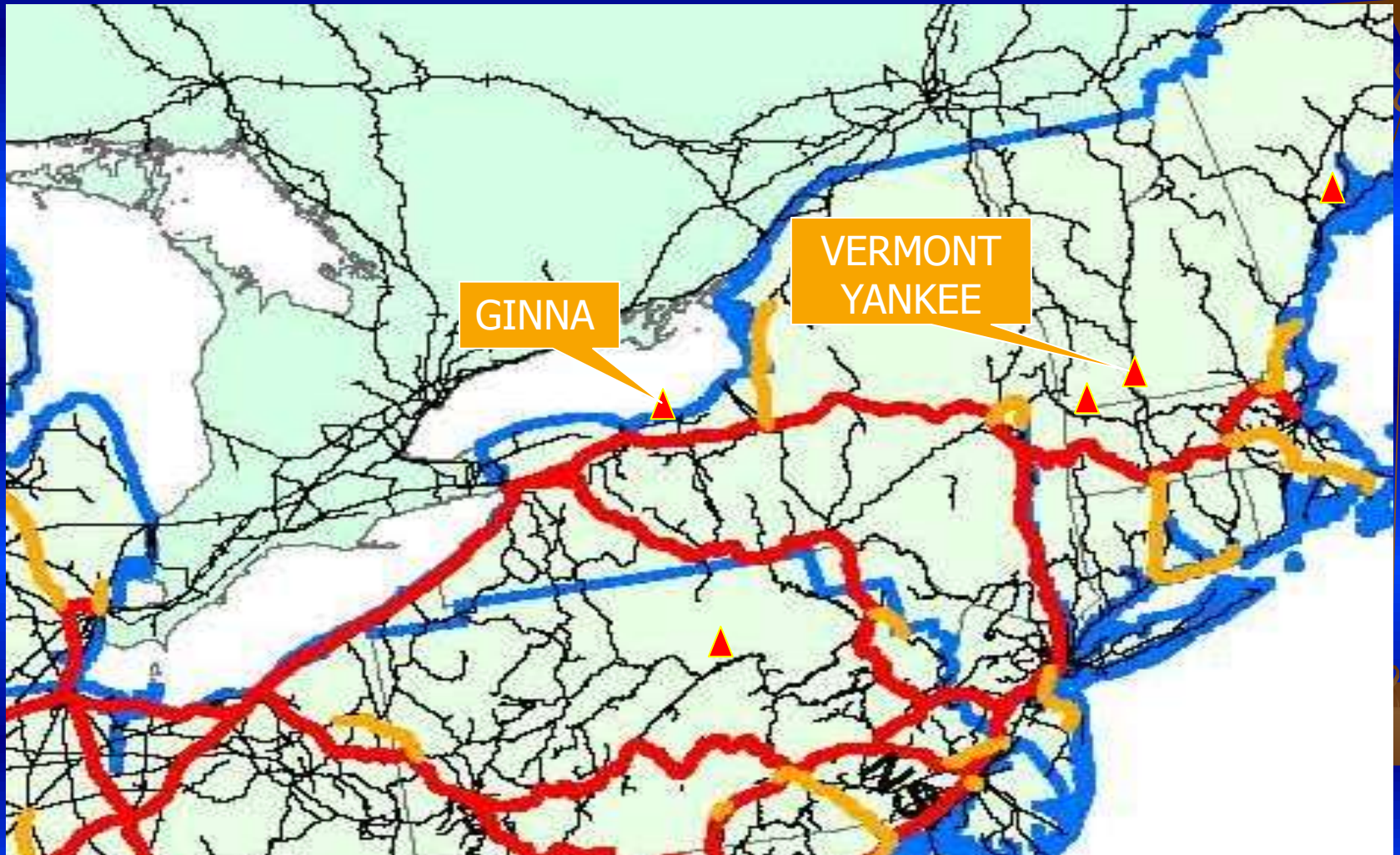
Strategic Rail Corridor Network Overlaid
on the General Rail System Map

STRACNET & Defense Connector Lines



Evaluation of Shortline Railroads

Strategic Rail Corridor Network Overlaid
on the General Rail System Map

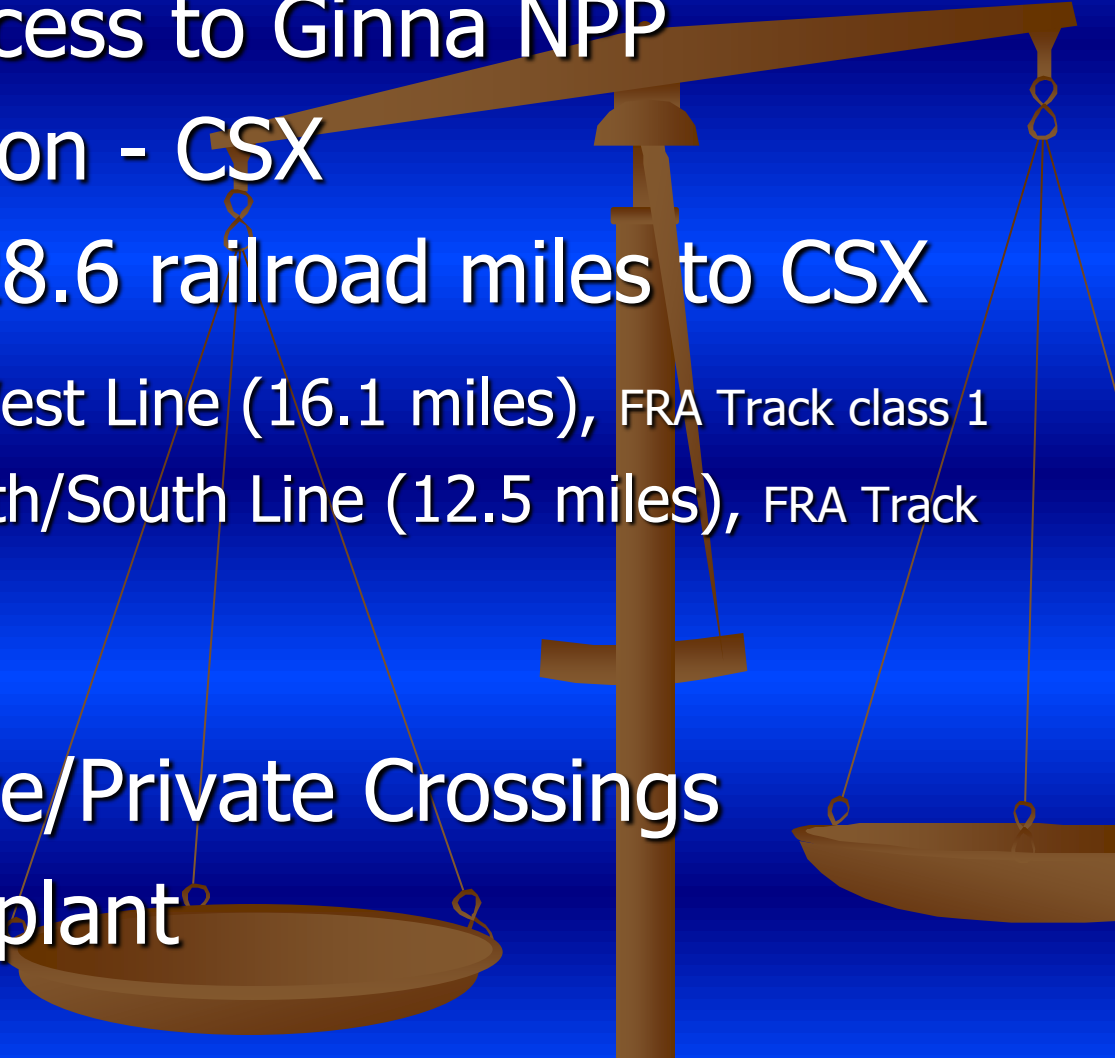


Evaluation of Shortline Railroads

Ginna/Ontario and Midland Railroad

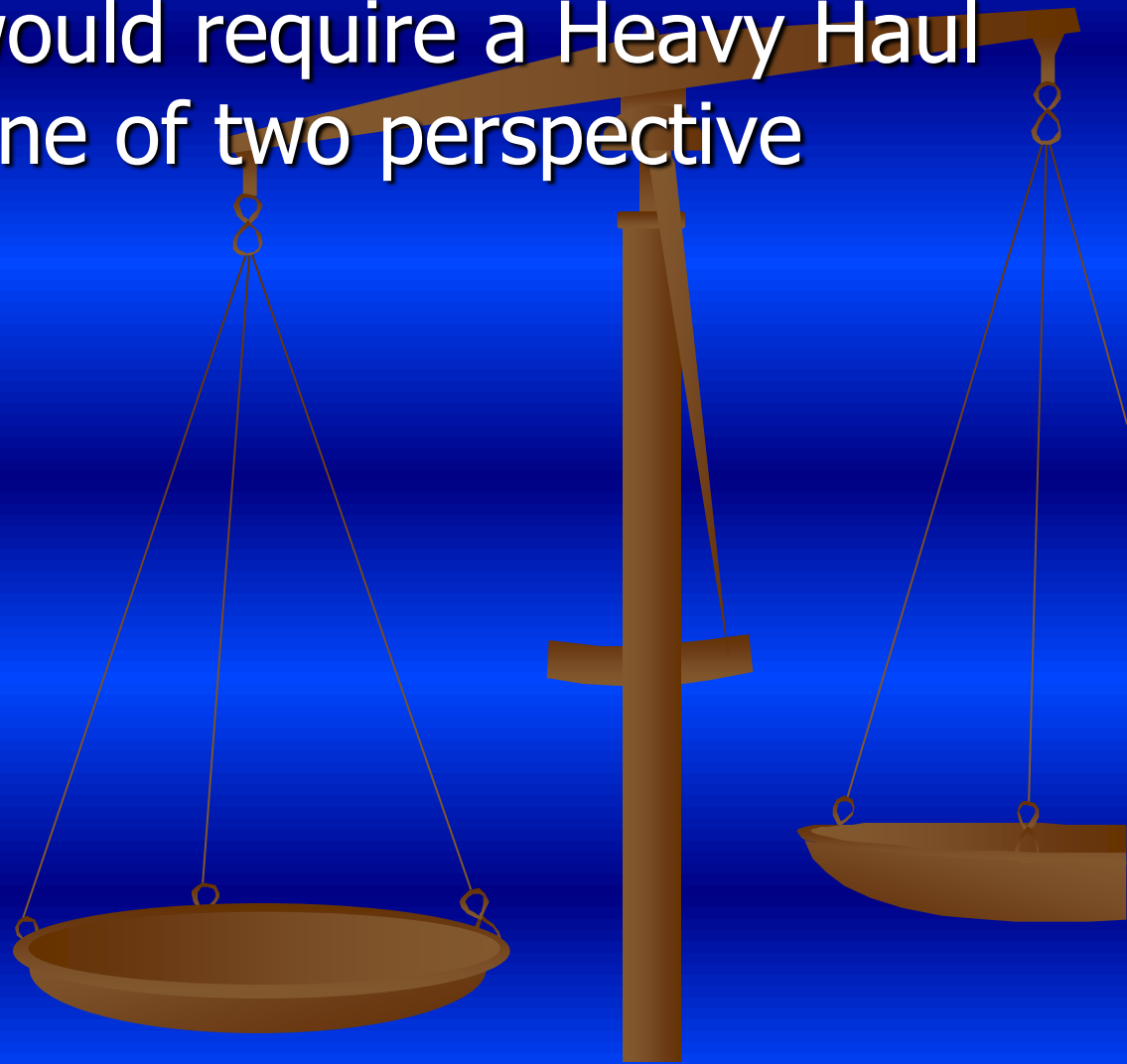


Evaluation of Shortline Railroads

- No direct rail access to Ginna NPP
 - Class 1 connection - CSX
 - Approximately 28.6 railroad miles to CSX
 - Ontario Line - East/West Line (16.1 miles), FRA Track class 1
 - Sodus Bay Line - North/South Line (12.5 miles), FRA Track class 2
 - Dark Territory
 - 28 Active/Passive/Private Crossings
 - Barge Slip near plant
- 

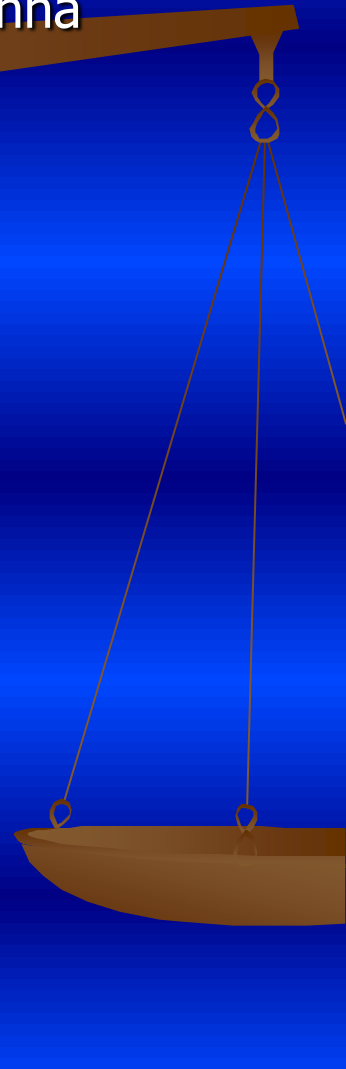
Evaluation of Shortline Railroads

- The shipment would require a Heavy Haul from Ginna to one of two perspective sites;



Evaluation of Shortline Railroads

Ontario Center Road (Route 350) Site 3.8 miles from Ginna



Evaluation of Shortline Railroads

Knickerbocker Road Site 4.8 miles from Ginna



Evaluation of Shortline Railroads

80 lb. Dudley rail on the Ontario Line
(milled using the open hearth process in the early 1900s)



Because this rolling process was utilized, the rail has internal impurities, including slag, air pockets, and so on which makes the rail prone to breaks when heavy lateral forces are imposed; heavy cars like the ones proposed to transport the spent fuel rods would have an adverse effect on this size rail.

Evaluation of Shortline Railroads

130 lb. PS rail on the Sodus Bay Line



A series of S-curves between the CSX interchange and MP 18.0 on the Sodus Bay Line have sharp curves of 10, 11, 12, and 13 degrees. A curve greater than 8 degrees limits the type of rolling stock able to negotiate over them. A rigid frame triple axle truck could easily derail trying to negotiate these curves.

Evaluation of Shortline Railroads

Photographed and Documented all Bridges



Evaluation of Shortline Railroads

Photographed and Documented all Crossings



Evaluation of Shortline Railroads

Barge Site Option - used previously by Ginna



Evaluation of Shortline Railroads

Areas of Concern:

Ontario Line

80lb. Dudley Rail

Poor Tie Condition

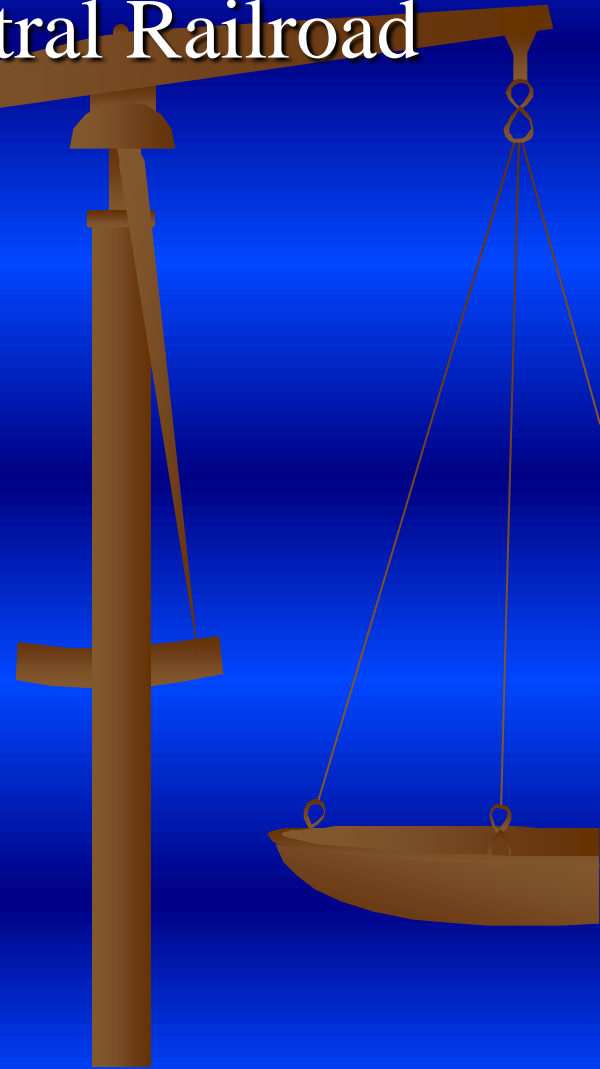
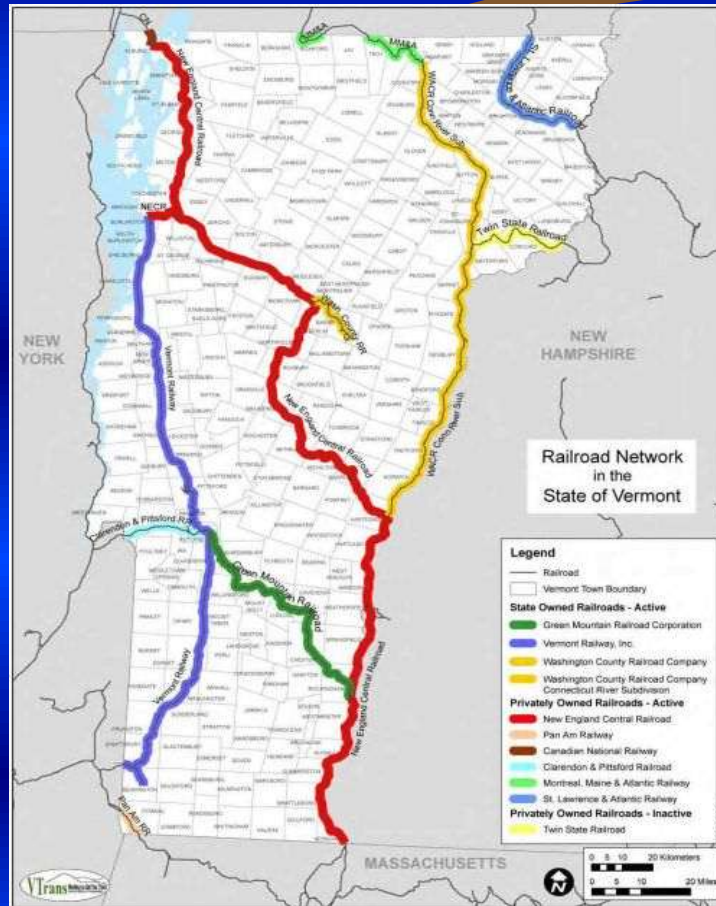
Sodus Bay Line

Sharp "S" Curves at Interchange



Evaluation of Shortline Railroads

Vermont NPP/New England Central Railroad

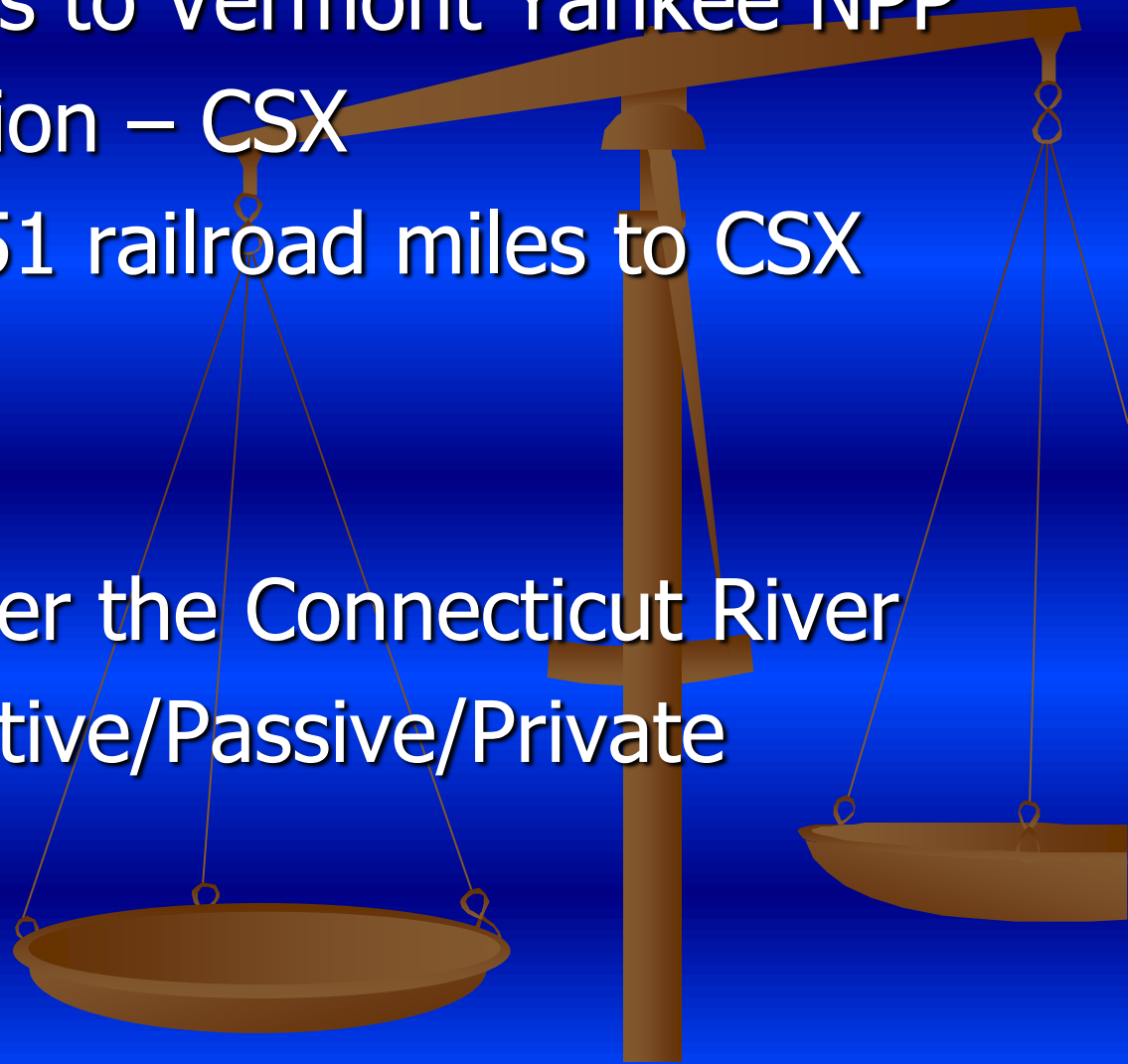


Evaluation of Shortline Railroads

- Direct rail access to Vermont Yankee NPP
- Class 1 connection – CSX
- Approximately 51 railroad miles to CSX

FRA Track Class 2 and 3

- Amtrak Route
- Major Bridge over the Connecticut River
- 17 Crossings Active/Passive/Private
- 13 Bridges



Evaluation of Shortline Railroads

Connecticut River Bridge



Evaluation of Shortline Railroads

Under Grade Bridges



Evaluation of Shortline Railroads

Over Grade Bridges



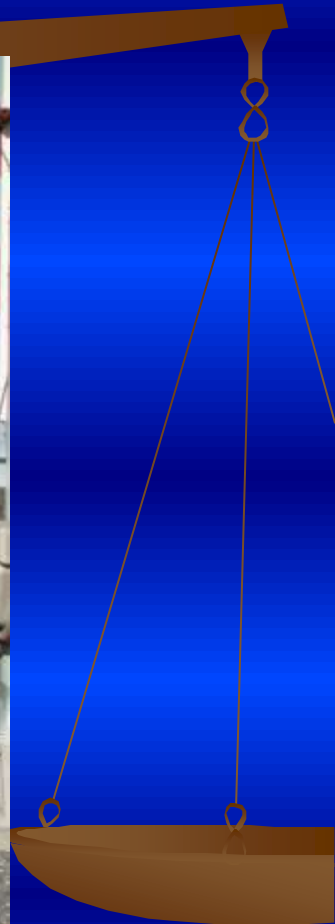
Evaluation of Shortline Railroads

Small Bridges



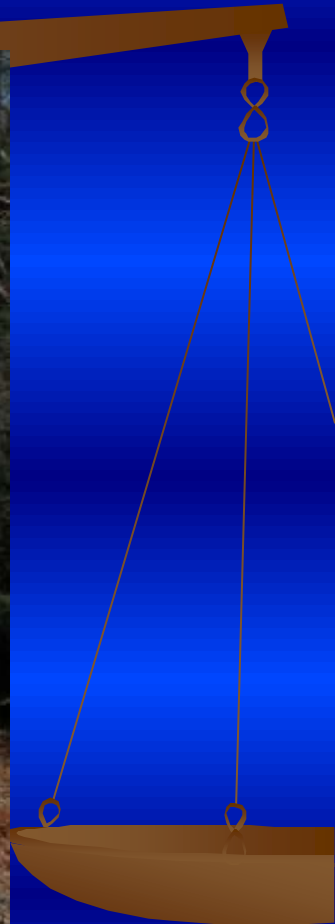
Evaluation of Shortline Railroads

Active Crossings



Evaluation of Shortline Railroads

Passive Crossings



Evaluation of Shortline Railroads

Private Crossings



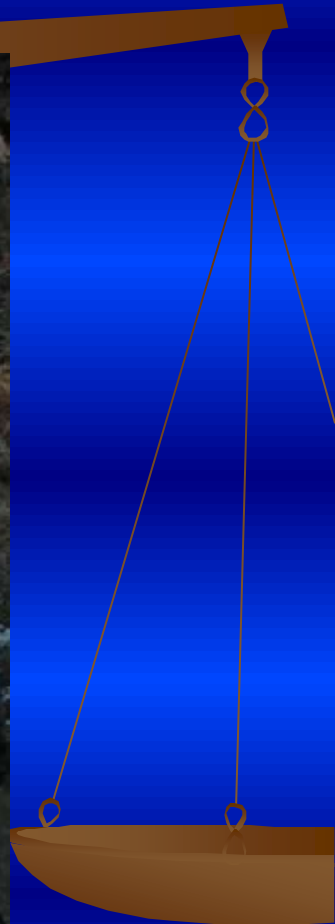
Evaluation of Shortline Railroads

Turnouts (Switches)



Evaluation of Shortline Railroads

Clearances

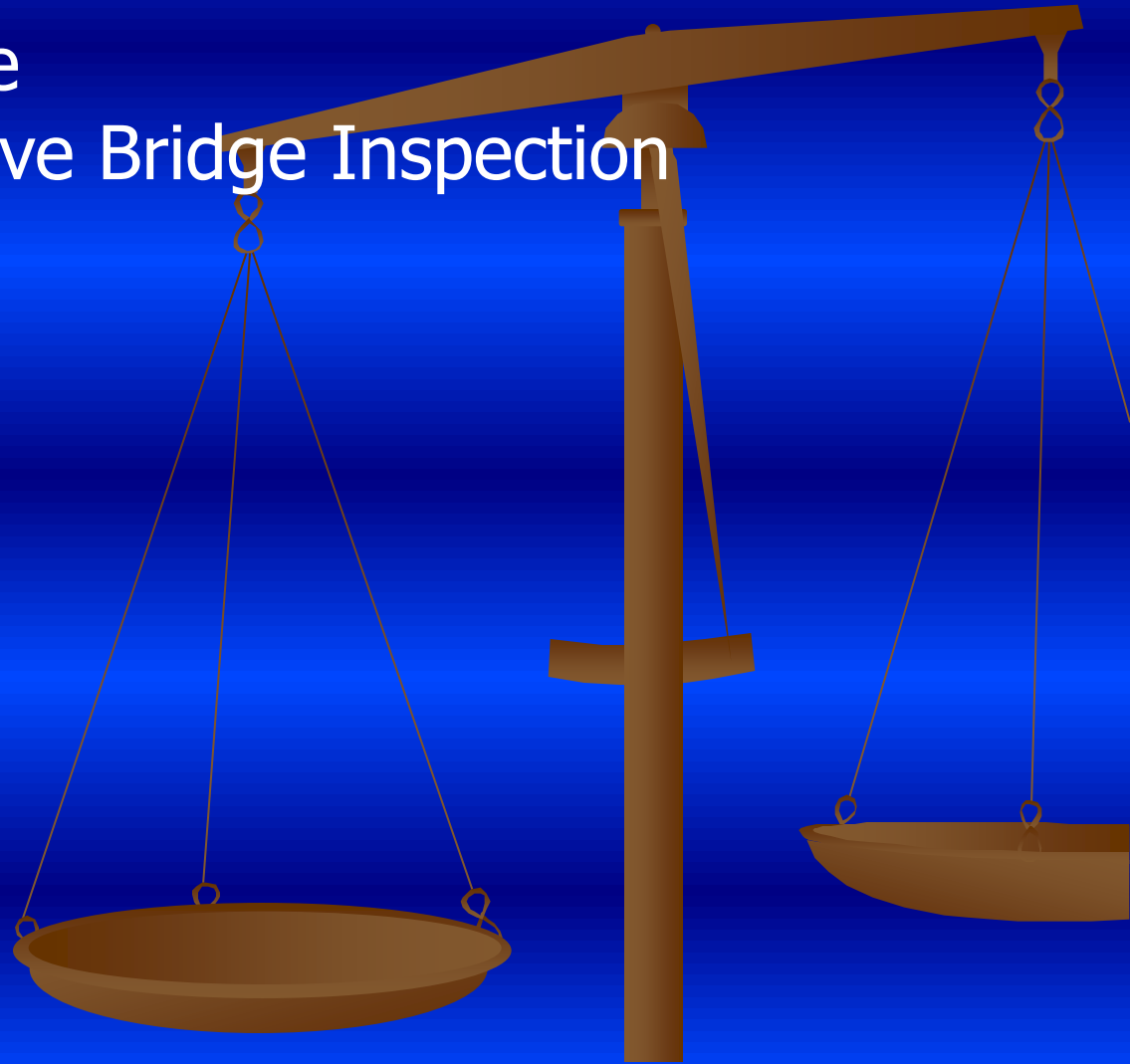


Evaluation of Shortline Railroads

Areas of Concern:

Amtrak Route

Comprehensive Bridge Inspection



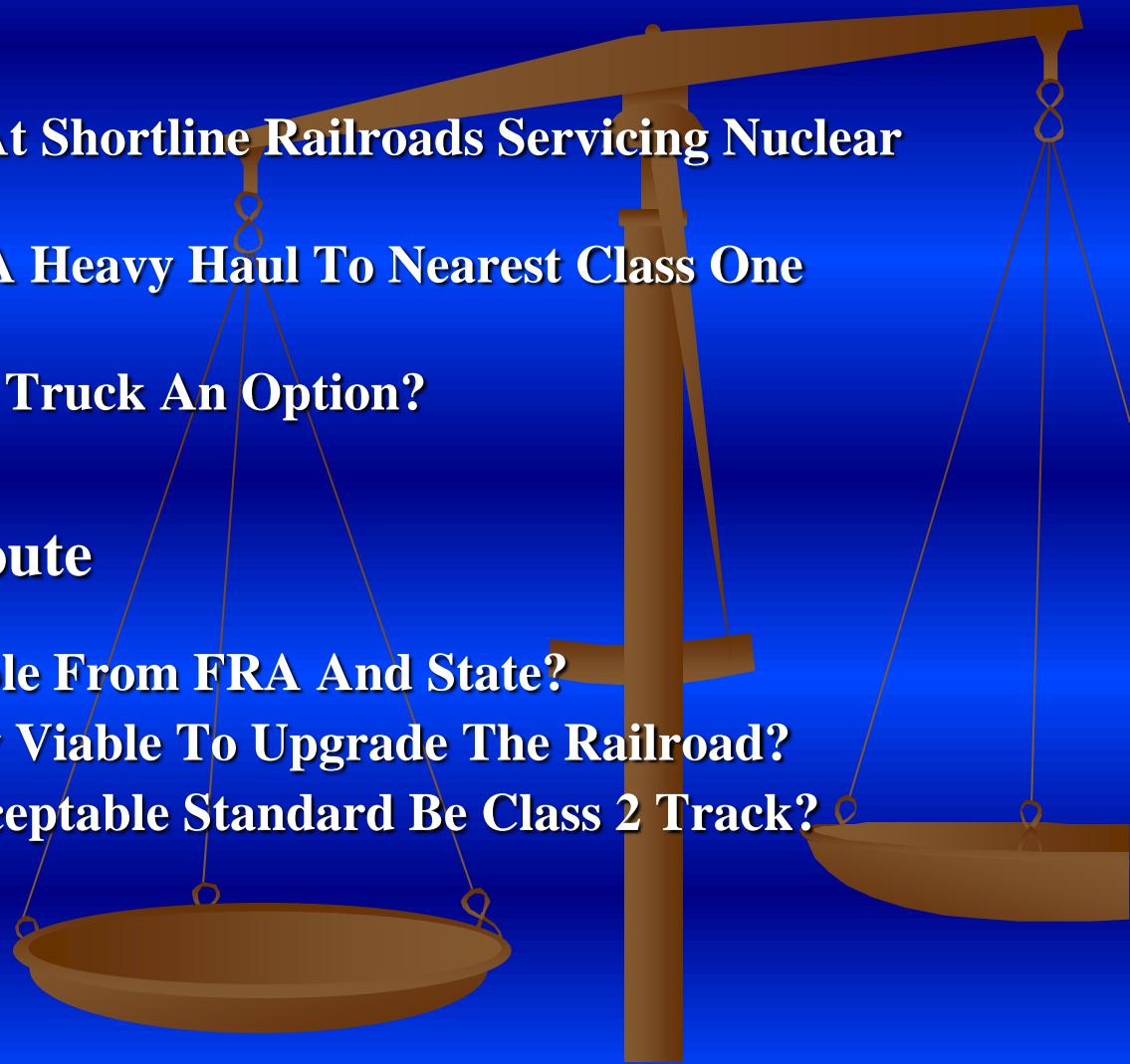
Evaluation of Shortline Railroads

Conclusions,

- **Need For In-depth Look At Shortline Railroads Servicing Nuclear Power Plants!**
- **Options To Transport VIA Heavy Haul To Nearest Class One Railroad!**
- **Is Barge Or Legal Weight Truck An Option?**

If Rail Is The Logical Route

- **Are There Grants Available From FRA And State?**
- **Would It Be Economically Viable To Upgrade The Railroad?**
- **Should The Minimum Acceptable Standard Be Class 2 Track?**



Evaluation of Shortline Railroads

If Rail Is The Logical Route

- We should adopt the Department of Defense's protocol for rail line acceptability particularly on connector lines and preferably leaning towards the Desirable

TABLE 1

MEASURES OF CIVIL RAIL LINE DEFENSE READINESS CONDITION

	Acceptable	Desirable
STRACNET		
FRA Track Class	2	≥ 3
Freight Train Speed (Maximum)	25 mph	≥ 40 mph
CONNECTORS		
FRA Track Class	1	≥ 2
Freight Train Speed (Maximum)	10 mph	≥ 25 mph

SNF/HLW Rail Shipment Inspections



Evaluation of Shortline Railroads

The Ginna NPP/Ontario Midland Railroad and Vermont NPP/New England Central Railroad studies facilitated by:

Lee Finewood – DOE

Cort Richardson – NE CSG

Mel Massaro – FRA

Presented by: Pat Edwards and Mel Massaro
Federal Railroad Administration

