

-----Original Message-----

From: [REDACTED] [1](#)

Sent: Wednesday, January 12, 2011 4:41 PM

To: Fusrap, LRB

Cc: [REDACTED]

Subject: IWCS Remedial Alternatives Technologies Development and Screening Technical Memorandum

Development of Interim Waste Containment Structure Remedial Alternatives Technologies Development and Screening Technical Memorandum

Partial removal alternatives.

All partial removal alternatives will reduce, mobility, toxicity and onsite volumes by transporting residues to a secure location.

Phased plan for remedial action

Phase one: removal of L-50 from bldg 414 & 413, packaging and transportation

Phase two: removal of L30 from Bldg 411 Phase 3: remove k-65 from recarbonation

pit Phase 4: remove k-65 from 411 within 5 years of work inception Remove R-10

Phases are in increasing order of accessibility and/or radium content.

Start with the buildings 413 and 414. These are circular concrete tanks, 62 feet in diameter and 19 feet deep. The contents were originally 7% uranium ore before processing at Linde. These are the longest in-place residues at NFSS. The goals will be to avoid the problems at Fernald and develop equipment and training for cover removal, residue removal, handling, packaging, and shipment of Afrimet ores. If there is a radium separation process, that can also be developed and tested.

For all partial removal alternatives, the portion of the IWCS north of the buried water treatment plant will remain in place. This mound requires a number of groundwater extraction wells to maintain an inward groundwater gradient to drain the liquid flows into the IWCS through any leaks in the Clay cut off wall and through the impervious clay bottom (previously punctured by wells) as well as removing excess water from rainfall, snowfall and summer watering. The plant cover on this cap will require maintenance, watering and repair as necessary for the long term.

Following the extraction of each of the Afrimet Residues in powder or slurry forms, there are the options of (a) mixing the residues with a stabilizer such as concrete and filling barrels or (b) processing the tailings on site to separate the sulfates, particularly barium-radium sulfates and consequently the source of radon generation, and possibly also the portion containing the bulk of the uranium. The uranium tailings could be shipped in bulk to a uranium recovery facility. The radium content of the L-50 and L-30 residues may be low enough to ship these tailings in bulk without radium extraction to a uranium recovery facility. An analysis can be made to determine what types of container are needed to ship the uranium bearing slurry to a facility for uranium recovery. The residual tailings would then be deposited in that facility's tailings piles. If uranium recovery is feasible, that revenue might offset some of the costs of disposal.

The radium contaminated sulfates would be hermetically sealed in canisters to be shipped off site for possible radium extraction in the future.

Disposal options at Out-of-state locations.

The radiation exposure to residents along the route from NFSS to a disposal site in the US or Canadian West must be minimized by choosing the least exposure route. For example a route crossing Erie, Cleveland and Chicago population centers would generate a maximum population exposure. Several alternative routes must be evaluated and explicitly compared. Multi-modal transport could include water, rail and road followed by road transport for the final portions of the route.

Border crossing. I anticipate there are federal, state and, in Canada, national and provincial regulations for radioactive shipments. I did not anticipate bridge authority regulations. I am not aware of any currently operational uranium mills in the US, but there are operational mills in Canada that even have provisions for diluting high grade ores with lower grades to reduce the occupational radiation exposures.

Containment with little or no treatment.

These alternatives are not long-term effective. The hazardous lifetime of Radium and even longer lifetime isotopes and the fact the radium curie content of the IWCS is the largest in any location east of the Rocky Mountains. This site is a former lake bottom that was deposited less than 10 thousand years ago. That is not a long time compared to the half life of Radium. The USACE has already cleaned up and removed residues from sites with much smaller quantities of radioactivity.

Classification: UNCLASSIFIED

Caveats: NONE

RULES & REGULATIONS

EFFECTIVE FEBRUARY 1, 2010

**NIAGARA FALLS BRIDGE COMMISSION
5365 MILITARY ROAD
LEWISTON, NEW YORK
14092**

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Rules and Regulations Governing the Use of the Niagara Falls Bridge Commission
Facilities – Including the Regulations Governing Transportation of Explosives and other
Dangerous Articles.

Effective February 1, 2010

The Niagara Falls Bridge Commission (the “Commission”) exists by virtue of a Joint Resolution of the Congress of the United States of America being Chapter 490, 75th Congress, 3rd Session, as amended. In Canada, the Commission is a private, not for profit public benefit corporation licensed as an Extra Provincial Corporation by the Province of Ontario. It is also subject to Canada’s International Bridges & Tunnels Act.

These Rules and Regulations were adopted by the Commission pursuant to the provisions of Section 1630 of the Vehicle and Traffic Law of the State of New York and the general powers granted to the Commission under its enabling Act cited above.

The Commission owns and operates three international bridges across the Niagara River known as the Rainbow Bridge, the Whirlpool Rapids Bridge (connecting Niagara Falls, New York and Niagara Falls, Ontario) and the Lewiston-Queenston Bridge (connecting Lewiston, New York and Queenston, Ontario).

NIAGARA FALLS BRIDGE COMMISSION
RULES AND REGULATIONS
ARTICLE 1 – DEFINITION

1. **BRIDGE**
Means that area or part of the vehicular crossing between the inspection canopies at the terminals of the bridges of the Commission.
2. **BUS**
Means all commercial vehicles having the capacity for 10 or more persons, including the operator.
3. **COMMISSION**
Means the Niagara Falls Bridge Commission.
4. **OPERATOR**
Means the driver or any person, who pushes, draws, propels, operates or is in charge of a vehicle.
5. **PARK OR PARKING**
Means the standing of any vehicle on the roadway, whether occupied or not, otherwise than temporarily for the purpose of and while actually engaged in loading or unloading merchandise or passengers.
6. **PASSENGER AUTO**
Means every type of motor driven vehicle used for the transportation of passengers and registered as such, and includes without limitation taxicabs, vehicles rented for hire, mobile homes with two or more axles, vans and buses (family and commercial) seating less than 10, and pick-up trucks.
7. **PEDESTRIAN**
Means any person afoot.
8. **PEDESTRIAN CROSSING**
Means the bridge sidewalk, approach sidewalk, terminal area walks, pedestrian overpass and other designated area walks, pedestrian and standing areas under the pedestrian walkways and standing areas under the jurisdiction of the Commission.
9. **ROADWAY**
Means that part of the bridge, bridge plazas, approaches, yards and terminals designed for the use of motor vehicles.

NIAGARA FALLS BRIDGE COMMISSION
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ARTICLE 1 – DEFINITION
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10. **STOP OR STOPPING**
When prohibited means any halting, even momentarily of a vehicle, whether occupied or not, except when necessary to avoid conflict with other traffic or in compliance with the direction of a Commission employee, any police officer, traffic control sign or signal.
11. **TRACTOR**
Means a motor vehicle designed and used for driving or drawing other vehicles but having no provision for carrying loads independently.
12. **TRAILER AND SEMI-TRAILER**
Means a vehicle without motive power drawn by a motor driven vehicle.
13. **TRUCKS**
Means any motor vehicle operated on a public highway, designed, used or maintained primarily for the transportation of property including self-propelled vehicles, except those classified as buses, taxicabs, passenger autos, tractors and trailers or semi-trailers.
14. **VEHICLE**
Means every device in, upon or by which any person or property is or may be transported or drawn upon the roadway.
15. **VEHICULAR CROSSING**
Means the entire projects or facilities under the jurisdiction of the Commission, including but not limited to the bridges, bridge plazas, approaches, employee parking areas and truck yards.
16. **DESIGNATED FAST LANE**
Means that part of the bridge, bridge plazas and bridge approaches designated for use by trucks in which the carrier and driver are approved in the Free and Secure Trade (F.A.S.T.) program that is administered by U.S. Customs and Border Protection (U.S.C.B.P.) and the Canada Border Services Agency (C.B.S.A.)
17. **BICYCLE**
Means a pedal driven human powered vehicle.

ARTICLE II - TOLL RATES
RAINBOW, WHIRLPOOL-RAPIDS AND LEWISTON-QUEENSTON BRIDGES
CASH TOLLS – CHARGED IN WESTBOUND DIRECTION ONLY

	<u>U.S.</u>	<u>CAN.</u>
1. Children Under 5 years	Free	Free
2. Pedestrians	\$0.50	\$0.50
3. Automobile and Taxi Cabs	\$3.25	\$3.50
4. In Tow (per axle)	\$3.25	\$3.50
5. Motorcycles	\$3.25	\$3.50
6. RV/Limousines – per axle	\$3.25	\$3.50
7. Wagon	\$3.25	\$3.50
8. Bicycle	\$0.50	\$0.50
9. Fire Apparatus and Driver	Free	Free
10. Motor Bus and Operator (not engaged in daily scheduled operation over Bridge)		
2 axles	\$10.25	\$10.75
3 axles	\$13.50	\$14.25
11. Tractors (Farm or Commercial) and Driver (no lugs permitted)	\$3.25	\$3.50
12. Baby Carriages	Free	Free
13. Ambulances	Free	Free
14. Funerals-Each Automobile & Hearse	\$3.25	\$3.50
15. Commercial Float (same as commercial vehicles {truck})		

COMMUTATION TOLLS – CHARGED IN WESTBOUND DIRECTION ONLY

<i>ExpressPass</i> on the Rainbow and the Lewiston- Queenston Bridges	\$2.75	\$2.95
Nexus Toll, Whirlpool-Rapids Bridge Only	\$2.75	\$2.95

*Automobiles, taxis and motorcycles

COMMERCIAL VEHICLES TRUCKS

Truck rates based on the number of axles	<u>U.S. Rate</u>	<u>Canadian Rate</u>
Charged in westbound direction		
2 Axle	\$3.25	3.50
3 Axle	\$6.50	6.75
4 Axle	\$12.50	13.25
5 Axle	\$18.50	19.50
6 Axle	\$24.50	26.00
7 Axle	\$30.50	32.25
8 Axle	\$36.50	38.50
9 Axle	\$42.50	45.00
10 Axle	\$48.50	51.25
11 Axle	\$54.50	57.50
12 Axle	\$60.50	64.00

*(The right is reserved to examine the Bill of Lading to determine weight of cargo carried)

All Trucks with a height of 15 feet 6 inches or greater (eastbound), 14 feet 6 inches or greater (westbound), 11 feet wide or greater, or over 130,000 pounds are required to clear loads, in advance, through the Commission Operations Centre (905-354-5641, ext. 4161 or 716-285-6322, ext. 4161).

Surcharges are applied to over-weight Trucks that are cleared to cross as follows:

	<u>U.S.</u>	<u>Canadian</u>
	Normal Charge	Normal Charge
100,000-130,000		
130,000-135,000	\$55.00	\$58.00
135,001-140,000	\$66.00	\$69.75
140,001-145,000	\$77.00	\$81.25
145,001-150,000	\$88.00	\$93.00
150,001-170,000	\$165.00	\$174.25
All weights over 170,001	\$220.00	\$232.50

OVER WIDTH TRUCKS

Whenever special arrangements, such as closing one side of the Bridge, to allow extremely wide Trucks to cross, additional charges will be charged (\$440.00 U.S. or \$464.75 CDN).

Operators of Trucks and Tractor-Trailers, whether light or loaded, shall upon request of a Commission employee, permit examination of such papers and/or documents as may be deemed necessary to determine weight of the load being carried over the facility.

ARTICLE III – TYPES OF TRAFFIC EXCLUDED FROM USE OF THE FACILITIES

1. DANGEROUS OR UNSAFE VEHICLES

Vehicles loaded in such a manner with such materials or so constructed or equipped as possibly to endanger persons or property or likely to render the use of the Bridges, Plazas, yards, terminals, warehouse, or building unsafe, are not allowed in or upon said area or buildings. Without limiting the foregoing the following types of Vehicles are not allowed in or upon said areas and buildings:

- a. Vehicles with persons standing on the outside thereof, or trucks with persons sitting on the rear with feet dangling.
- b. Vehicles having flat tires.
- c. Vehicles (including Vehicles used for construction) with metal tires, tracks or solid rubber tires.
- d. Pushcarts, wheelbarrows, velocipedes and similar Vehicles. (However, bicycles may be walked, not ridden, on bridge sidewalks and other walk areas normally provided for pedestrian traffic.)
- e. Vehicles loaded with garbage, papers, loose hay, straw or loose materials not effectively covered.
- f. Vehicles loaded with animals or poultry not properly confined.
- g. Vehicles overloaded to such an extent that the means of propulsion are insufficient.
- h. Vehicles with inadequate brakes.
- i. Vehicles transporting explosives and other dangerous materials or articles, unless permitted under “Rules Pertaining to Niagara Falls Bridge Commission Regulations Governing Transportation of Explosives and Other Dangerous Articles” over, on, through or in any part of the Commission’s facilities as herein enumerated. (See Article VI)
- j. Buses with passengers standing between the driver and the front entrance door or so located as to obstruct the view of the driver in any way.
- k. Vehicles emitting excess smoke or fumes.

1. Vehicles exceeding the following specifications:

Rainbow Bridge:

Overhead clearance13-1/2 feet
Maximum vehicles width.....11 feet
Load limitsStandard Loading

Whirlpool Rapids Bridge:

Overhead clearance13 feet
Maximum vehicle width11 feet
Load limitsStandard Loading

Lewiston-Queenston Bridge:

Overhead clearance14 feet 6 inches westbound
.....15 feet 6 inches eastbound
Maximum vehicles width.....11 feet
Load limits130,000 lbs.

Vehicles desiring to cross Rainbow Bridge with loads of 50 tons or over or the Lewiston-Queenston Bridge with loads of 65 tons or over, or exceeding the limits as to width or overhead clearances above set forth, must obtain special permission from the Operations Centre for such crossing under such terms and conditions as the Commission in its sole discretion shall prescribe.

[The Commission reserves the right to determine whether any vehicle is of unusual or unconventional design, weight or construction.]

- m. Other Vehicles which in the sole and exclusive judgment of the Commission employee in charge of the facility, are likely to delay traffic unreasonably, damage the facility or endanger persons or property.

2. ALL VEHICLES

Before using any portion of the facilities, all Vehicles shall be subject to inspection when, in the opinion of the Commission employee then in charge, such inspection shall be deemed necessary to determine whether such use would be in violation of these rules and regulations, and if in the sole and exclusive judgment of the such employee in charge a Vehicle is determined to be unsafe, then the use of any of the Commission's Vehicular Crossing by such Vehicle shall be prohibited.

ARTICLE IV – OPERATION OF VEHICLES

1. No person shall drive a motor Vehicle on any portion of the Vehicular crossing at a posted speed greater than is reasonable and prudent under the conditions and having regard to the actual and potential hazards then existing.
2. The limits specified or established herein, except where a special hazard exists that requires lower speed for compliance with the next preceding paragraph, shall be maximum lawful speed and no person shall drive a vehicle on the Vehicular crossing at a speed in excess of such maximum limits.

Rainbow Bridge 15 miles per hour

Whirlpool Bridge 15 miles per hour

Lewiston-Queenston 15 miles per hour

Nothing herein contained shall be construed to apply to Police and Fire Department vehicles, ambulances and to other emergency vehicles.

3. Every person shall obey the instructions of any official traffic control device applicable to him, placed in accordance with these rules unless otherwise directed by a Commission employee.
4. NO PERSON SHALL FAIL OR REFUSE TO COMPLY WITH ANY LAWFUL ORDER OR DIRECTION OF ANY COMMISSION EMPLOYEE.
5. All Vehicles which shall enter upon any Bridge or Plaza shall pay the toll as prescribed by Article II of these Rules, at the regularly established places or booths for the collection of such tolls.
6. No person shall stop, stand or park a vehicle upon any part of the Vehicular Crossing except:
 - a. When necessary to avoid injury or damage to persons or property.
 - b. In compliance with the direction of a Commission employee.
 - c. While paying toll.
 - d. When disabled.
 - e. In areas on the Vehicular Crossing provided and marked by signs, striping or other devices marked for such purposes.

- f. At designated stopping points prior to Customs and Immigration and Inspection booths.
- 7.
 - a. No person or persons shall leave a Vehicle unattended on the Vehicular Crossing except in case of emergency or in the conduct of business with the Commission, Customs Officials, Immigration Officials, Carriers or Customs Brokers, and then only in areas designated for those purposes.
 - b. When it is permitted for a motor vehicle to stand unattended, no person driving or in charge of such vehicle shall leave it so unattended without first stopping the engine, effectively setting the brakes thereon, and when standing upon any grade, turning the front wheels to the curb or block the wheels.
- 8. No “U” turns shall be made on any part of the Vehicular Crossing except under the direction of a Commission employee.
- 9. No person shall make repairs to a Vehicle or change a tire thereon in or upon the Vehicular Crossing unless authorized to do so by a Commission employee.
- 10. No person shall drive a Vehicle on the Vehicular Crossing using high beam headlights. The flashing of headlights or sounding of horns on the Vehicular Crossing is prohibited, except when in the interest of safety such procedures are required.
- 11. Upon the approach of any ambulance, Police or Fire Department vehicle, or upon the approach of a Commission Vehicle giving adequate warning by means of siren or warning lights, all traffic shall proceed as near as possible to the right hand curb on the roadway and stop, unless and until otherwise directed by a Commission employee or until such Vehicle or Vehicles shall have passed.
- 12. No person shall throw, dump or deposit or place or cause to be thrown, dumped or deposited or placed upon the Vehicular Crossing any refuse, litter or material of any kind and nature.
- 13. No person shall hitch-hike in or upon the Vehicular Crossing nor shall any person or persons congregate, stand, sit or loiter in or upon the buildings or areas of the Commission after a request by a Commission employee to disperse.
- 14. No person shall stand in or upon the Vehicular Crossing or any buildings or areas of the Commission to solicit from or sell or deliver anything to any occupant of any building or Vehicle upon the Vehicular crossing, except with written permission of the Commission, any type of goods or services.

15. No person shall teach or give instructions in operating Vehicles in or upon the Vehicular Crossing.
16. No truck shall use the designated FAST lane unless the carrier and driver of the truck are FAST approved.
17. Bicycles are permitted on the Rainbow Bridge and Lewiston-Queenston Bridge under the same circumstances as passenger vehicles. Cyclists should stay in the most far right lane designated for automobiles when entering the United States or Canada. Cyclists using the Lewiston-Queenston Bridge to the United States should make their way from the Niagara River Parkway to the Queenston toll house, located next to the toll line and check in with the Toll Captain, who will instruct them on how to safely cross the plaza to gain access to the United States bound lanes.

ARTICLE V – GENERAL

1. No assemblages, picketing, parades or demonstrations of any kind shall be held in or upon any of the Commission's buildings or the Vehicular Crossing without written permission from the Commission.
2. No persons shall damage, mark or deface any part of the Vehicular Crossing including any structure or appurtenance owned or under the control of the Commission.
3. Disabled Vehicles may be removed from the Vehicular Crossing by the Commission. The reasonable cost of such removal may be assessed by the Commission against the owner or operator thereof.
4. No persons shall transport or store in or upon the Vehicular Crossing any explosives or other dangerous materials or articles unless permitted under the "Rules Pertaining to the Niagara Falls Bridge Commission Regulations governing Transportation of Explosives and Other Dangerous Articles in or upon Facilities Operated by Commission" as set forth in Article VI.
5. Vehicles left unattended or any other property abandoned in or upon the facilities may be removed by the Commission.
6. The use of the facilities by any person or vehicle shall be deemed to be conditioned upon payment of the tolls hereinbefore set forth and upon observance of the forgoing rules and regulations.
7. No persons shall photograph or film on the Vehicular Crossing without first obtaining Commission approval and signing a liability wavier.

ARTICLE VI – RULES PERTAINING TO NIAGARA FALLS BRIDGE
COMMISSION REGULATIONS GOVERNING
TRANSPORTATION OF EXPLOSIVES AND OTHER
DANGEROUS ARTICLES IN OR UPON FACILITIES
OPERATED BY THE COMMISSION

1. These regulations apply to the Vehicular Crossings.
2. Any Vehicle, the loads of which includes, or is believed by a Commission employee to include, any dangerous article, and the load of such Vehicle, shall be subject to inspection to determine whether any such Vehicle would be in violation of these rules and regulations.
3. No Vehicle loaded with any dangerous articles shall enter in or upon the Vehicular Crossing unless the driver shall first produce a bill of lading or other shipping paper describing such article by the specific name therefore used in the “List of Explosives and Other Dangerous Articles” contained in the Interstate Commerce Commission regulations.
4. Wherever reference is made herein to “Interstate Commerce Commission regulations, “it shall refer to the regulations of the Interstate Commerce Commission which are included in Title 18 of the “United States Code” applicable to and dealing with the transportation of “Explosives and other Dangerous Articles” by motor vehicles on the highway. Reference is also made to Title 42 of the Code of Federal Regulations.
5. No Vehicle shall enter the Vehicular Crossing if its load includes any weapon of war including a weapon of war employing atomic fission or radioactive force, or any component part of such weapon containing a fissionable material, or any forbidden explosives as defined by Interstate Commerce Commission regulations.
6. No Vehicle shall enter the Vehicular Crossing if its load includes:
 - a. Any Class A or B explosives (other than special fireworks – including railway or track torpedoes – not in excess of 10 pounds gross weight per vehicle) as defined by Interstate Commerce Commission regulations, or
 - b. Any radioactive material including, but not limited to, radioisotopes, nuclear fissionable material, reactor fuel rods, irradiated fuel rods, and radioactive ores, residues, and wastes, except under the following conditions:
 - 1) Written permission must be obtained from the Commission at least 2 days before intending travel over the Vehicular Crossing.

- 2) If permission to use the Vehicular Crossing is granted by the Commission, passage may be made only on the specific day and within such hours as stipulated by the Commission. Vehicles and their loads requiring special handling will be subject to any and all costs, in addition to the regular toll, for such special handling provided, however, common, contract and private carriers transporting (i) radioisotopes used for medical, industrial, agricultural, or research purpose; (ii) natural uranium metal, depleted uranium, magnesium-thorium alloys in formed shapes (not powered, and which shall contain not more than 4% nominal thorium 232); (iii) radium or radon sealed in needles, capsules or similar platinum-iridium or gold containers used for medical purposes; or (iv) manufactured articles other than liquids, containing radioactive material as component parts, namely, clock and instrument dials, electronic tubes, test instruments, x-ray machines, packaged, marked, labeled and limited in a properly placarded Vehicle as required by the Interstate Commerce Commission regulations, may use the Vehicular Crossing without prior notice or time restriction.
- 3) Vehicles transporting Class A or B explosives or radioactive materials, their contents and shipping documents shall be subject to inspection by a Commission employee prior to proceeding over the Vehicular Crossing.
- 4) Operators of vehicles transporting Class A or B explosives, or radioactive materials must comply with all orders, instructions and directives of a Commission employee.
- 5) Vehicles transporting Class A or B explosives, or radioactive materials, whether halted or in motion, must remain at least 300 feet behind any Vehicle traveling in the same direction while crossing bridges.

No vehicle loaded with any dangerous article or substance shall be allowed to use or otherwise occupy the Vehicular Crossing (or any part thereof) without first complying with all applicable laws, rules and regulations of the United States of America, the State of New York, the Government of Canada and the Province of Ontario including, without limitations all such laws, rules and regulations relating to the packaging, marking, labeling, description, certification, quantity, limitations, loading, placarding, and marking of Vehicles containing dangerous articles or substances.

ARTICLE VII – PENALTIES

Violation of any rule or regulation governing or regulating traffic on that portion of the Vehicular Crossing within the territorial limits of the United States of America shall be a traffic infraction as that is defined in the Vehicle and Traffic Law of the State of New York and shall be punishable as such.

Violation of any rule or regulation governing or regulating traffic on that portion of the bridge within the territorial limits of Canada shall be a traffic infraction as that is defined in the *Highway Traffic Act (Ontario)* and punishable as such.

Violation of any other rule or regulation contained herein shall be cause for denial of the use of the Vehicular Crossing at the discretion of the Commission's General Manager or his agent.

Non-Compliance:

	U.S.	Canadian
1 st Violation	Letter	Letter
2 nd Violation	\$125.00	\$132.00
3 rd Violation	\$250.00	\$264.00
4 th Violation	\$350.00	\$369.75
5 th Violation	Denied Crossing	Denied Crossing
Overnight Storage (wide loads)	\$100.00	\$105.75
Trailer Drops (per 12 hours)	\$20.00	\$21.25

Violation of any rule or regulation governing the use of the designated FAST lane will result in the offending truck being returned to the roadway of the country (United States of America or Canada) from whence it came and/or a non-compliance fine at the discretion of the Commission's General Manager or his agent.

ARTICLE VIII – AMENDMENTS

1. These Rules and Regulations may be amended from time to time by resolution of the Commission duly adopted.