434.13.3 Bridge Attachments. Special requirements are involved in this type of crossing. The use of higher strength lightweight steel pipe, proper design and installation of hangers, and special protection to prevent damage by the elements or bridge and approach traffic shall be considered. Any agreed upon restrictions or precautions shall be contained in the detailed specifications. Inspectors shall assure themselves that these requirements are met.

(16) 434.13.4 Railroad and Highway Crossings

(a) The safety of the general public and the prevention of damage to the pipeline by reason of its location are primary considerations. The great variety of such crossings precludes standard design. The construction specifications shall cover the procedure for such crossings, based upon the requirements of the specific location.

(b) Installation of uncased carrier pipe is preferred. Installation of carrier pipe, or casing if used, shall be in accordance with para. 402.8. As specified in para. 461.1.7, if casing is used, coated carrier pipe shall be independently supported outside each end of the casing and insulated from the casing throughout the cased section, and casing ends shall be sealed using a durable, electrically nonconductive material.

434.13.5 Directionally Drilled Crossings. Written plans shall be developed for all directionally drilled crossings or for when directional drilling is selected as a pipe lay method. Plans will include the following:

(a) crossing plan and profile drawings showing all pipelines, utilities, cables, and structures that cross the drill path, are parallel to and within 100 ft (30 m) of the drill path, and that are within 100 ft (30 m) of operation, including mud pits and bore pits.

(b) damage prevention plan to reduce the likelihood of damage to adjacent underground facilities, including pipelines, utilities, cables, and other subsurface structures. The plan shall consider the accuracy of the method to be employed in locating existing structures and in tracking the position of the pilot string during drilling. Consideration should be given to having an auxiliary location system to include manual excavation to ensure that the drilling bit or reamer is following the projected path and does not encroach upon crossing or parallel lines. The damage prevention plan should provide specific instructions regarding the notification of affected parties, including the participation in one-call systems where applicable.

(c) written safety plan to include contingency plans in the event the drilling string impacts subsurface facilities. The safety plan should identify facilities and resources to be utilized in the event of an emergency or any personnel injuries. The safety plan shall be reviewed on-site with all construction personnel prior to the commencement of drilling operations.

(d) plan for containment and disposal of drilling fluids, if used.

(e) hydrostatic test plan that should consider pre-testing of the fabricated string(s) prior to installing the crossing.

The following publications provide guidance on design of directionally drilled crossings:

– American Gas Association PR-227-9424 “Installation of Pipelines by Horizontal Directional Drilling, An Engineering Design Guide”

– American Society of Civil Engineering, Practice No. 89 — “Pipeline Crossings Handbook”

– Directional Crossing Contractors Association publications “Guidelines for a Successful Directional Crossing Bid Package,” “Directional Crossing Survey Standards,” and “Guidelines for Successful Mid-Sized Directional Drilling Projects”

434.14 Inland Coastal Water Construction

Plans and specifications shall describe alignment of the pipeline, depth below mean water level, and depth below bottom if ditched. Special consideration shall be given to depth of cover and other means of protecting the pipeline in the surf zone. Consideration shall be given to use of weight coating(s), anchors, or other means of maintaining position of the pipe under anticipated conditions of buoyance and water motion. Complete construction inspection shall be provided. Precautions shall be taken during construction to limit stress below the level that would produce buckling or collapse due to out-of-roundness of the completed pipeline.

434.15 Block and Isolating Valves

434.15.1 General

(a) Block and isolating valves shall be installed for limiting hazard and damage from accidental discharge and for facilitating maintenance of the piping system.

(b) Valves shall be at accessible locations, protected from damage or tampering, and suitably supported to prevent differential settlement or movement of the attached piping. Where an operating device to open or close the valve is provided, it shall be protected and accessible only to authorized persons.

(c) Submerged valves on pipelines shall be marked or spotted by survey techniques to facilitate quick location when operation is required.

434.15.2 Mainline Valves

(a) Mainline block valves shall be installed on the upstream side of major river crossings and public water supply reservoirs. Either a block or check valve shall be installed on the downstream side of major river crossings and public water supply reservoirs.

(b) A mainline block valve shall be installed at mainline pump stations, and a block or check valve (where applicable to minimize pipeline backflow) shall be