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Sent: Monday, February 29, 2016 5:15 PM

To: Monroe, Pamela

Subject: Further thoughts on Site 300 high pressure pipeline Corrosion Protection

February 29, 2016

Dear Ms. Monroe,

It has come to our recent attention that there may be some confusion of siting requirements for pipelines especially regarding Corrosion Protection (CP) systems and pipelines siting near high power electric lines for co-location or adjacency motifs.

We respectfully require that the Site 300 rules include the safety for New Hampshire residents and the protection for gas pipeline assets of consequence and their purveyors.

Explanation of issues anticipated:

1) Siting of gas pipelines near high power electrical lines results in induced magnetic and electric fields within the pipeline's metallic structure (ultimately creating voltage potentials and flowing currents induced "through thin air" from the wires to pipeline structure).

2) This induced voltage and ultimately current induced and flowing within the pipeline structure, as a result of the above, results in galvanic reaction and electrolysis speeding up corrosion of the pipeline.

a. In so-called rural areas (determined by cold and impersonal statistics) thinner-walled schedule pipe may be and is allowed to be used which renders less time for corrosion to effect its final blow to pipeline structures.

b. By way of similar interests, states like New Jersey has effected requirements that require thicker walled pipe to be installed "everywhere" for projects in New Jersey

3) To combat this speed-up of galvanic reaction, electrolysis and corrosion, corrosion protection (CP) systems are employed with

a. sacrificial anode beds;

b. (electrically noisy) DC rectifiers impressing and counteracting reactions coupled with sacrificial anode beds;

c. other related work-arounds like protective plastic coatings on the pipeline infrastructure;

d. other maintenance and test coupon requirements, noting that some of the larger applicant(s) companies know to operate in the United States have been cited twice or more for starving maintenance budgets allegedly for bolstering profits

4) We have seen notion that pipeline purveyors need not bury pipelines below the deeper New Hampshire frost line as shallow depths are seemingly afforded by Federal Regulation

a. Pipeline purveyors may concede that the use of "frost free" soils could mitigate this situation.

i. As a general rule, fine materials like sand tend to retain water (and form frost) where course materials like gravel tend to not retain water (nor form frost) as such they are considered frost free soils.

ii. The pipe is warm due to the natural physics of gas flowing through a pipe at design pressures.

However, gas flow is not guaranteed to be constant or prevail.

iii. Differential frost heaving is deleterious and can rupture pipeline infrastructure that pipeline purveyors wish to protect.

b. Pipes vibrate much like tuned organ pipes when perturbed by gas flow and compressor stations.

i. Gravel of "frost free" soils has sharp edges or (in the case of rounded tail-ends gravel) pressure points that, coupled with vibrating pipes, pierce through the protective plastic coatings outside of the pipe, that are also designed to prevent a return path of electric current flow that aids electrolysis and speeds up corrosion.

ii. Thrifty project or engineering economy desires of applicant(s) are irrelevant for siting requirements of safety, planning and longevity of any project

To summarize: Pipelines running adjacent or co-located to high power electrical lines, that vibrate due to gas flow and compressor stations as tuned organ pipes buried shallow above the frost line in piercing "frost free" soils that can ultimately pierce protective coatings and complete unintentional pipeline electrical circuit currents-to-earth that speeds up corrosion and ultimately failure is apparently deleterious to the assets of the applicant(s) company and to the stakeholder, residents and customers thereof within the siting of the same.

Therefore it is helpful for applicant(s) to learn of and be aware of, for the siting of high pressure gas infrastructure, the seemingly more robust requirements above. We require that siting rules for Site 300 be mindful of, and ultimately correct or otherwise remedy these notional paradigms for any applicant(s) project(s).

Our Best Thanks,
-chris Mackensen
Electrical Engineer
Monadnock Region of this, the Great State of New Hampshire