

Enclosure 2: Responses to Public Suggestions

Regulatory Guide (RG) 4.21 “Minimization of Contamination and Radioactive Waste Generation: Life Cycle Planning”

TA Technical Associates sent NRC petitions for rulemaking on March 26, 2012 (ML121280451) and August 15, 2012 (ML12270A318) in which there are recommendations for revision to RG 4.21 relative to the use of automatic real-time continuous alarming radiation monitoring systems. NRC denied the petitions in June 22, 2012 (ML121280539), and January 15, 2013 (ML12268A125) because the petitioner did not propose a general solution to a problem in the regulations. Subsequent to the second denial TA Technical Associates sent NRC’s Office of Administration, an e-mail on February 6, 2013 inquiring about how to submit portions of the petitions dealing with regulatory guides and this was referred to the Regulatory Guide Development Branch. The Branch’s Regulatory Guide Specialist spoke directly to TA Technical Associates regarding submission of comments via the Branch’s web page. Although none were received following that telephone call, NRC decided to consider the suggestions from the two petitions in the periodic review of RG 4.21, and this is not a response to the petitions. The periodic review is being done as per directions in Management Directive 6.6 “Regulatory Guides.”

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ADAMS Accession No. ML121280451 and ML12270A318

Commenter	Section of RG 4.21	Specific Comment	NRC’s Resolution
TA Technical Associates	Section A INTRODUCTION	10 CFR 20.1406 applies to applicants for licenses (either that <u>including</u> early site permits and renewals), design certifications, and approvals of standard designs, and manufacturing licenses. The regulation requires the submittal of design information and	Disagree with the suggested change to 10 CFR 20.1406. The extension to early site permits and renewals were considered and not adopted during revisions of the regulation in 2007 and 2011. The focus is on applications, design

		operational procedures for (1) minimizing radioactive waste generation and contamination of the facility and the environment, and (2) facilitating decommissioning. As specifically stated in 10 CFR 20.1406: (a) Applicants for licenses, either <u>including</u> early site permits and manufacturing licenses under part 52 of this chapter and renewals, whose applications are submitted after August 20, 1997, shall	certifications and approval of standard designs.
TA Technical Associates	B. DISCUSSION Figure 1. Decision Paths for Determining the Applicability of RG 4.21	-- Liquids – Consider provisions to <u>detect</u> , prevent and control inadvertent liquid releases to the facility and the environment. -- Gases -- Consider provisions to <u>detect</u> , prevent and control gaseous releases.	Agree with the suggestion. The importance of leak detection is not neglected in RG 4.21. It is clearly spelled out in Section C. Regulatory Position in Section 1.3 “Prompt Detection of Leakage,” and Section 1.4 “Avoidance of the Release of Contamination from Undetected Leaks.”
TA Technical Associates	C. REGULATORY POSITION	<u>1.1 General Statement</u> In general, an applicant should minimize radioactive contamination of the facility by using structure, system, and component (SSC) designs and operational procedures that limit leakage and/or control the spread	Agree with the concept of utilizing “automatic real-time continuous alarming radiation monitor systems” but disagree with wherever possible. This suggestion repeats itself several times in the comments. We agree

		of contamination. <u>Wherever possible</u> the design and operational procedures should provide for the early immediate detection of leaks utilizing automatic real-time continuous alarming radiation monitor systems thus allowing prompt assessment to support a timely and appropriate response. Applicants should note that 10 CFR 20.1406 requires that contamination be minimized "...to the extent practicable..." This implies that other competing concerns such as the implication to safety systems and the overall cost should be considered. Thus the minimization of facility contamination must be considered in the context of overall facility safety.	that early detection of the spread of radioactive contamination is important and it needs to be considered in a risk informed perspective. An automatic real-time monitoring system may be unwarranted for many situations especially those using little or no volumes of fluids where the focus should be on inventory control. The risk-informed approach is discussed in Section B, Discussion ("2. A Risk-Informed Approach") and at the top of page A-1. Quoting from the first paragraph: " ... A risk-informed approach (considering the kind of facility, materials and hazards involved) should be used by 10 CFR 20.1406 applicants when deciding on the extent to which the measures described in this guide would apply to a specific situation..."
TA Technical Associates	C. REGULATORY POSITION	<u>1.3. Prompt Detection of Leakage</u> The facility should be designed such that any SSC that has the potential for leakage is provided with adequate leak detection capability to the extent practical. In addition to design considerations to control and, if possible, prevent radioactive	Agree with the concept of utilizing "automatic real-time continuous alarming radiation monitor systems" but disagree with requiring in all situations. An automatic real-time monitoring system may be unwarranted for many situations especially those

		system leakage, it is important during operations to be able to promptly detect leakage as close as possible to the leakage source to allow timely intervention and to prevent the potential for widespread contamination. Thus, monitoring and routine surveillance programs are an important part of minimizing potential contamination. This approach should include <u>automatic real-time alarming air and water radiation monitors with data capture, analysis, and transmission features.</u> <u>T</u>he placement of instruments to detect leakage <u>should be</u> at readily accessible locations and the use of operational practices that will enable early detection of contamination. Because leakage detection is only the first step in minimizing contamination, the applicant also should be prepared to provide a timely assessment and response based on the location and characteristics of the leak or spill.	with little or no fluids where the focus should be on inventory control.
TA Technical Associates	C. REGULATORY POSITION	<u>2.1 Development of a Site Conceptual Model</u> In general, system design features	Agree with the suggestion.

		and operational procedures that prevent, detect, assess and/or control releases within the facility also contribute to minimizing contamination of the environment. For systems that directly interface with the environment, the first indication of a leak may be detection in an environmental monitoring system with alarm, data capture, analysis, data archive, and transmission features. To control and mitigate such events, it is prudent to have such an automatic real-time continuous radiation monitoring system facilitating the comprehensive understanding of the interface with environmental systems and the features that will control the movement of contamination in the environment.	The intent of the site conceptual model is that at the time of application one would have an idea of what to expect should there be uncontrolled release of radioactive contaminants particularly in the subsurface. That was the intent of the section when it was written. The suggested changes turn the focus away from the concept of the site model to monitoring. The early detection of leaks is found in the RG in the previous section.
TA Technical Associates	C. REGULATORY POSITION	2.2 Provision for Early Detection of Leakage and Contaminant Migration <u>(new subsection proposed)</u> <u>2.2.2 Systems, structures, or components (SSCs) that have access to the immediate environment via air/gas or water should be equipped with automatic real-time continuous radiation monitoring instrumentation</u>	Disagree with the suggestion requiring automatic real-time continuous radiation monitoring instrumentation with alarms for the reasons given above. An automatic real-time monitoring system may be unwarranted for many situations.

		<u>with alarms to prevent inadvertent release to the surrounding environs, within the facility, on-site, and off-site.</u>	
C. REGULATORY POSITION	<u>2.3 Final Site Configuration</u> Applicants covered by 10 CFR 20.1406 should consider the site configuration following construction to aid in preventing the offsite migration of radionuclides via an unmonitored pathway. 10 CFR 20.1406 applicants should identify, as early as practical in the licensing process, the potential pathways of radioactive contaminants through the surface and subsurface. Applicants covered by 10 CFR 20.1406(a) should develop an onsite monitoring program, as an integral part of the radiological environmental monitoring program. <u>New developments in air/gas and water automatic real-time continuous radiation monitors with alarms are available as both portable instruments and as fixed installation and are capable of data capture, assessment, data archive and</u>	Disagree with insertion of the proposed text. The proposed text is presented as a point of new information. Automatic real-time continuous radiation monitors with alarms capable of data capture, assessment, data archive and retrieval and transmission to facility operators are not a new development. It does not add anything to the concept that an onsite monitoring program should be developed considering the nature of the materials, the risk, and the available monitoring devices.	

TA Technical Associates		<u>retrieval, and transmission to facility operators.</u> The program should provide early detection and quantification of leaks and spills and maintain a current baseline of radiological and hydrogeological parameters. Plans for responding to the detection of leaks and spills should reflect the final facility design and site configuration.	
	D. IMPLEMENTATION	The purpose of this section is to provide information to 10 CFR 20.1406 applicants regarding the NRC's plans for using this regulatory guide. The NRC does not intend or approve any imposition or backfit in connection with its issuance. <u>In many cases backfitting will be necessary to upgrade radiation monitoring systems to new more efficient and effective technology.</u> In some cases, 10 CFR 20.1406 applicants may use proposed or previously established acceptable alternative methods for complying with specified portions of the NRC's regulations. Otherwise, the methods described in this guide will be used in evaluating compliance with 10 CFR 20.1406. <u>(NOTE TO REVIEWER: The</u>	Disagree with the proposed revision of this section. Since 10 CFR 20.1406 is intended for applicants, backfit would not be expected.

TA Technical Associates		<u>sentence deleted is vague and ambiguous. As such it may be confusing to the applicant.</u>	
	REGULATORY ANALYSIS	The NRC staff did not prepare a separate regulatory analysis for this regulatory guide. The regulatory basis for this guide is the regulatory analysis prepared for the amendments to 10 CFR Part 20 promulgated July 21, 1997 (62 FR 39058). <u>(NOTE TO REVIEWER: As stated, this Guide originated in 1997 with review in 2008. Current technology is extremely advanced and sophisticated compared to that time frame. Guidance within this document and other linked documents and CFRs requires updating and be brought into alignment with the incredible strides in radiation monitoring instrumentation now available. In most cases upgrading will prove to be cost effective, labor efficient, and provide the means for the desired and required timely response.)</u> That Regulatory analysis examined the costs and benefits of the rule as implemented by this guide. A copy of that regulatory analysis is available for inspection	Disagree with the comment. It is of a general nature and it implies that the NRC staff are unaware of technical advancements in monitoring since 1997. Automatic real-time continuous radiation monitors with alarms capable of data capture, assessment, data archive and retrieval and transmission to facility operators are not a new development. RG 4.21 addresses the importance of early leak detection without the specificity advocated by the comments and stresses that it should be done in a risk-informed manner appropriate to the kind of facility using the guide.

			and may be copied (for a fee) at the NRC Public Document Room, located at One White Flint North, 11555 Rockville Pike, Rockville, MD 20852.	
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