

TRW

16 February 1977

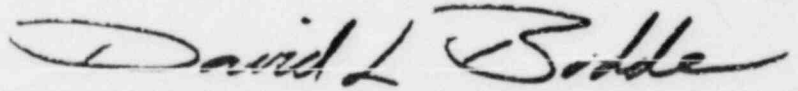
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Issue
I 52*

Mr. L. J. Evans, Jr.
Chief, Requirements Analysis Branch
Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Evans:

Attached please ^{find} an option paper which addresses Basic Capability
4 as a whole. This builds upon our previous option papers of 31
January and 4 February.

Sincerely,



David L. Bodde
Manager, Nuclear Regulatory Programs

DLB:cs
Attachment

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OPTION PAPER
BASIC CAPABILITY 4

PURPOSE

This paper serves a twofold purpose: first it presents a containment option which was not addressed in our last Containment Option Paper; second it analyzes how that option might be used in Basic Capability 4.

A NEW CONTAINMENT OPTION

We might define containment as: "the last physical barrier which an adversary must penetrate to gain effective access to SSNM." The term "effective access to SSNM" means that the adversary has sufficient control of the material to carry out his purpose. One implication of this definition is that multiple containment barriers are required if the licensee is to meet the full spectrum of threats to SSNM. This can be shown by analyzing two prototypical threats: violent assault by outsiders aimed at bulk theft of nuclear material, and the diversion of small amounts of material by insiders.

- Theft By Outsiders. Here the adversary has effective access to SSNM when he seizes portable containers in which the material is stored. This implies that the storage vault is the last physical barrier which the adversary must penetrate prior to gaining such control, and hence the vault itself becomes "containment." In the case of a continuous flow operation, the adversary has gained effective control when he has penetrated the piping or vats in which the material is being processed. Thus, these structures become containment.
- Diversion By Insider. Here the adversary only has effective access to SSNM when he physically seizes small quantities of the material. If these quantities are smaller than the size of the smallest container, the adversary must open that last container. This container then becomes "containment." In the continuous flow operation, the containment becomes the valves through which small quantities can be diverted.

Since the licensee must be prepared to defend against both the insider and outsider threat, this definition in effect requires multiple "layers" of containment.

A second implication of this definition is that authorized place is subsumed into the concept of containment. If one of the containment barriers is essentially non-mobile as the above analysis indicates it must be, then the placement of SSNM within such containment fixes its location in an authorized place. Therefore, the Basic Capability can be simply stated as, "Assure SSNM is within authorized and unbreached containment." Or, we can avoid using the relatively awkward term "unbreached" by stating the Capability as, "Assure SSNM is within authorized containment and that containment integrity is maintained." The meaning of both statements is the same.

Finally, we note that effective use of this definition must be a two-place process. In the first phase, the licensee and NRC assess the facility and its safeguards systems against the Design Basis Threat. The result of this assessment is the labeling of certain physical barriers surrounding SSNM as "containment." In the second phase, the licensee (and NRC) must assure that this containment remains unbreached and that all SSNM remains inside in proper types and quantities.

The advantages and disadvantages of this definition of the term containment are as follows.

Advantages

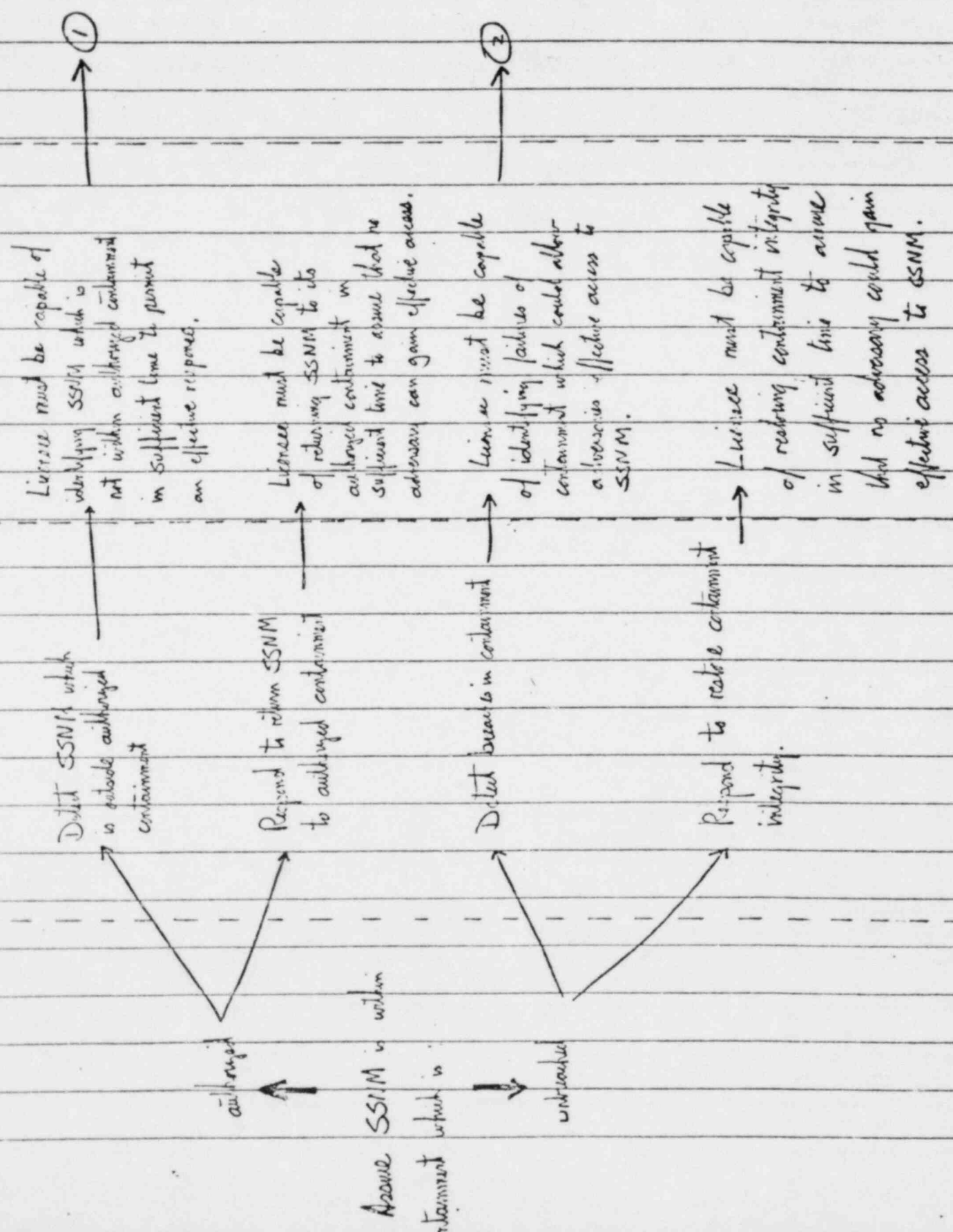
- Maximum information value is gained from the containment (see Containment Option Paper, pages 1 and 2)
- The delay value of containment is recognized (see Containment Option Paper, page 3)
- The licensee is forced to think through generic diversion paths in order to determine what is "containment" in his facility. Thus containment is effectively defined on a site-specific basis.

Disadvantages

- This definition may be considered vague or complex. It will certainly require explanation in a Regulatory Guide.

BASIC CAPABILITY 4

In the flow charts which follow, this concept of containment is used in the disaggregation of BC 4.



SUBSYSTEMS

SECURITY LEVEL PERFORMANCE

