

**UNITED STATES OF AMERICA**  
**NUCLEAR REGULATORY COMMISSION**

**Title:                BRIEFING ON MATERIALS EVENTS DATABASE -  
PUBLIC MEETING**

**Location:            Rockville, Maryland**

**Date:                Tuesday, December 12, 1995**

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1 UNITED STATES OF AMERICA  
2 NUCLEAR REGULATORY COMMISSION

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5 BRIEFING ON MATERIALS EVENTS DATABASE

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7 PUBLIC MEETING

8  
9 Nuclear Regulatory Commission  
10 One White Flint Plaza  
11 11555 Rockville Pike  
12 Rockville, Maryland

13  
14 Tuesday, December 12, 1995

15  
16 The Commission met, pursuant to notice, at 2:01  
17 p.m., the Honorable SHIRLEY A. JACKSON, Chairman of the  
18 Commission, presiding.

19  
20 COMMISSIONERS PRESENT:

21 SHIRLEY A. JACKSON, Chairman of the Commission  
22 KENNETH C. ROGERS, Member of the Commission

23  
24  
25  
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1 STAFF AND PRESENTERS SEATED AT THE COMMISSION TABLE:

2

3 HUGH THOMPSON, DEPUTY EXECUTIVE DIRECTOR, NMSS & OPERATIONS

4 SUPPORT

5 CARL PAPERIELLO, DIRECTOR, NMSS

6 RICHARD BANGART, DIRECTOR, OFFICE OF STATE PROGRAMS

7 PATRICIA LARKINS, HEALTH PHYSICIST, OSP

8 EDWARD JORDAN, DIRECTOR, AEOD

9 ERNIE ROSSI, DIRECTOR, SAFETY, PROGRAMS DIVISION, AEOD

10 SAMUEL PETTIJOHN, DIRECTOR, SAFETY PROGRAMS DIVISION, AEOD

11 JOHN C. HOYLE, SECRETARY

12 KAREN D. CRY, GENERAL COUNSEL

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## P R O C E E D I N G S

[2:01 p.m.]

CHAIRMAN JACKSON: Well, good afternoon, everyone.

Today the Staff will be briefing the Commission on the Nuclear Materials Event Database. Access to standard and complete information and data can be very valuable, obviously, in assessing any technical program, as Mr. Jordan well knows.

While assessments of programs can be and have been conducted without the benefit of a computerized database, the ease, accuracy and flexibility that a sound and solid computerized database provides in assessing the performance of a program cannot be underestimated.

In recent years, the various programs within the NRC Materials Program have come under increased scrutiny by various organizations, and this scrutiny has extended into the agreement states materials licensing programs as well.

Now, one common theme of these reviews of the NRC's programs has been the need for capability to evaluate the overall effectiveness of the programs in terms of protecting public health and safety. The Commission recognizes that the nuclear material events database project is in its early stages of development.

At the same time, however, the Commission looks forward with great anticipation to having and further

1 developing a tool that will provide us with a greater  
2 ability to evaluate the effectiveness of the various  
3 activities in our materials program and to make appropriate  
4 management decisions about program direction.

5 Both Commission Rogers and I are looking forward  
6 to your presentation.

7 Commission Rogers, do you have anything you would  
8 like to add?

9 COMMISSIONER ROGERS: Nothing in addition, thank  
10 you.

11 CHAIRMAN JACKSON: If not, you may proceed, Mr.  
12 Thompson.

13 MR. THOMPSON: Thank you, Chairman Jackson.

14 As you properly identified, the need to have  
15 events -- an ability for the staff to look at events that  
16 may be precursors has been a history of NRC since the  
17 accident at Three Mile Island. We've known the need for  
18 reactor event evaluation and precursors has been an  
19 important area and, as you said, more recently events have  
20 focused our attention on the materials area. There are  
21 obviously more than 6,000 NRC material licensees and more  
22 than twice that number in the agreement states. So there's  
23 quite a number of licensees that this would cover. These  
24 licensees use byproduct source and special nuclear material  
25 and a wide variety of activities that include but are not

1 limited to the industrial measuring, medical diagnosis and  
2 therapy, weld logging and nuclear fuel production.

3 Today's briefing will describe the nuclear  
4 materials events database, which is about one year old and  
5 which is managed by the AEOD. However, that database, as  
6 you correctly noted, supports many activities, both by NMSS  
7 and the Office of State Programs and the Agreement States;  
8 so we have, in addition to the AEOD, Ed Jordan and Dr. Rossi  
9 and Samuel Pettijohn. We have Carl Paperiello and Dick  
10 Bangart and Pat Larkins from the Office of State Programs to  
11 answer any questions as the briefing goes on that might  
12 apply to their office.

13 So, Ed, I'll turn the briefing over to you.

14 MR. JORDAN: I would reiterate the range of  
15 materials activities that we are reviewing, they vary widely  
16 from the highest level of technology to repetitive  
17 industrial processes and simple gages, and from very large  
18 corporations or institutions to one-person operations. So  
19 this is a very wide set of licensees.

20 Previous NRC data collection activities also were  
21 widely distributed. We had them in various offices and on  
22 various systems by various individuals, and the object here  
23 was to compile a database that would satisfy most all of  
24 those needs.

25 The object or the purpose of a combined materials

1 database is to facilitate corporate learning among  
2 appropriate sets of licensees through better compilation and  
3 easier access to the information and by effective feedback  
4 of experiences derived from these analyses.

5 Could I have slide three, please.

6 [Slide.]

7 MR. JORDAN: The NRC and the regulated industry  
8 should be able to trend performance among similar types of  
9 licensees to identify areas where emphasis may need to be  
10 changed. And this is the object of being able to monitor  
11 performance.

12 A significant complication in this process is the  
13 fact that about two-thirds of the 2,200 materials licensees  
14 are regulated by agreement states, and although reporting  
15 regulations must be compatible with NRC requirements, there  
16 is no requirement for the agreement states to report these  
17 events to the NRC.

18 The result was that the NRC opportunity to compile  
19 and extract generic lessons was limited. Individual states  
20 had even smaller opportunity among their smaller number of  
21 licensees.

22 So the process of setting up this database for the  
23 purpose of sharing information led to a trial program with  
24 the agreement states for voluntary submittal of event  
25 reports, including prompt notification of serious events to



1 the NRC Operations Center. That trial program is currently  
2 underway, and although we will comment on participation, we  
3 have not reached any conclusions at this point.

4 I would at this point like to ask Mr. Pettijohn to  
5 begin his presentation.

6 Go to slide 2, please.

7 MR. PETTIJOHN: I'd like to have slide 4, please.

8 MR. JORDAN: I was going to offer slide 2 as --

9 MR. PETTIJOHN: Oh, sorry.

10 MR. JORDAN: -- the list of topics that we plan to  
11 cover.

12 MR. PETTIJOHN: Oh, okay. We can go to slide 2,  
13 then.

14 Okay. Chairman Jackson and Commissioner Rogers, I  
15 will be providing some of the details in the discussion of  
16 the development and implementation of an enhanced nuclear  
17 material events database. We wanted to talk about currently  
18 what existed and how the information is used, why we came to  
19 a conclusion that there was a need to improve the nuclear  
20 material events database, and some of the objectives, things  
21 that we were hoping to accomplish with the new database, and  
22 then look in some detail at how we collect information and  
23 code it and input it into the database and then how the  
24 staff might have access to this information.

25 I would like to go to slide 4, please.

1 [Slide.]

2 MR. PETTIJOHN: The current process which covers  
3 NRC Program Offices and the regions involves various actions  
4 for receiving information that's sent in to the NRC for  
5 materials licensees and doing certain evaluations with this  
6 information.

7 The regions generally look at material event  
8 information to take immediate action or prompt action to  
9 correct an immediate problem. The area that I will be  
10 discussing mostly involves event information after it gets  
11 in a database and some of the uses of this information, such  
12 as analysis.

13 Could I have slide 5, please.

14 [Slide.]

15 MR. PETTIJOHN: This information material event  
16 information, has been used for -- since essentially we  
17 started collecting it back in 1981. Initially there was an  
18 event report that looked at therapy misadministrations or  
19 there was an analysis of therapy misadministrations based on  
20 information that was reported to NRC starting in 1981. This  
21 led to a recommendation for a quality management program for  
22 radiotherapy facilities.

23 Some more recent uses of material event  
24 information have involved studies that AEOD had conducted  
25 involving errors, misadministrations due to -- or

1 misadministrations due to computer errors, and also we've  
2 had recent studies that looked at human factors involving  
3 aspects of radiography overexposures and losses of control  
4 of material.

5 One of the findings of that most recent study was  
6 that even though a large number of events are submitted to  
7 NRC involving loss of control of material, for the most part  
8 very few events actually have involved exposure -- personnel  
9 exposures.

10 Also, I might mention that some of the more direct  
11 uses of nuclear material event information have been -- is  
12 input to inspection activities, and one of the uses will be  
13 made in input to the IMPEP, the Integrated Material  
14 Performance Evaluation Program.

15 Could I have slide 6, please.

16 [Slide.]

17 MR. PETTIJOHN: The nuclear material events  
18 database that we're discussing essentially is an enhanced  
19 version of an event database that AEOD has maintained since  
20 1981. The original database up until about 1994, though,  
21 had some limitations in terms of the detail information it  
22 was able to accommodate, and it also was not always coded  
23 the same, but most -- one of the most limiting factors of  
24 the earlier databases was the agreement state data were not  
25 included except in an ad hoc fashion.

1 I would like the next slide, please.

2 [Slide.]

3 MR. PETTIJOHN: In December 1992, the Cleveland  
4 Plain Dealer in Cleveland, Ohio, published a series of  
5 articles that investigated mistakes that were made in  
6 radiotherapy facilities over the past 17 years, and some of  
7 the incidents involved fatalities or serious events.  
8 Even though in some cases they were not directly regulated  
9 by the NRC, the article did show that NRC did not have  
10 adequate information on at least two fatal incidents, and it  
11 should have had information on other events relative to  
12 NRC's responsibility.

13 As a result of the articles and also a fatality  
14 that occurred at about the same time, there were a number of  
15 studies and reports that were done and that collectively,  
16 both internal and external reports, indicated that material  
17 events data were not complete and were not collected on a  
18 national level, and the reports also collectively  
19 recommended improvements in the collection system and also  
20 in the reporting of material event data.

21 Next slide, please.

22 [Slide.]

23 MR. PETTIJOHN: The objectives for the new  
24 database were based on identifying needs for improvement.  
25 That is, to include more detailed information such as

1 whether or not a patient was notified; to include related  
2 information for events that are reported, such as any  
3 manufacturer model numbers for equipment that might be  
4 involved. Also, it was to include provisions for ensuring  
5 that agreement state information is collected on the same  
6 form as NRC licensee data; and to improve the utility of the  
7 database by allowing the staff to have direct access to the  
8 information; and lastly, to include standard procedures for  
9 coding so that we can ensure consistent data.

10 Next slide, please.

11 [Slide.]

12 MR. PETTIJOHN: As the lead office for developing  
13 an improved database, AEOD solicited input and received from  
14 the NRC program offices, from the regions and from the  
15 agreement states. Including the agreement states early in  
16 the process served to create a partnership relationship with  
17 the agreement states for event reporting that included a  
18 commitment from the agreement states to improve reporting  
19 and also a commitment from NRC to provide the agreement  
20 states with the material event data.

21 The initial prototype that was developed from the  
22 input which primarily was through workshops with NRC,  
23 program offices and agreement states was used by the Idaho  
24 National Engineering Laboratory to develop a final database  
25 and about the same time AEOD requested IRM, the Information

1 Resource Management office, to develop or manage development  
2 of software to allow the Staff to access the database  
3 directly and that project got underway about in June of  
4 1994.

5 Idaho began coding material in the database in  
6 about January of that year.

7 Next slide, please.

8 [Slide.]

9 MR. PETTIJOHN: I would like to spend the next few  
10 minutes just talking about an overview of the database,  
11 primarily a collection of information and code and the  
12 quality assurance of the information that goes into the  
13 database.

14 The source of material event data NRC licensees  
15 are generally licensee reports that are submitted to NRC and  
16 also there is some information that is derived from  
17 inspection findings and we also get events in from --  
18 voluntarily reported by members of the public.

19 Next slide.

20 [Slide.]

21 MR. PETTIJOHN: Agreement state information comes  
22 from agreement states and not directly from the agreement  
23 state licensees.

24 The agreement states are requested to provide  
25 prompt notification to NRC for events for which their

1 licensees are required to notify them promptly. The goal  
2 after all the systems are in place is for the agreement  
3 states to be able to submit information directly,  
4 electronically to NRC.

5 The agreement states now have submitted  
6 information on a periodic basis that ranges from yearly to  
7 monthly.

8 COMMISSIONER ROGERS: Just before you leave  
9 that --

10 MR. PETTIJOHN: Yes?

11 COMMISSIONER ROGERS: The monthly, quarterly,  
12 annually event reports under the agreement state data, how  
13 different is the information that is included there from  
14 what is in the last two items of the NRC data chart on the  
15 previous slide?

16 In other words the required licensee followup  
17 written reports and the event information from NRC  
18 inspections and investigations, that kind of information, is  
19 there -- does it have a similar structure, does the  
20 agreement state data have a similar structure to that in  
21 some way? Is there a parallel there?

22 MR. PETTIJOHN: In some cases the agreement state  
23 data have a similarity because it's information that has  
24 been reviewed by the agreement state and then entered into  
25 an event record so it would have taken advantage of any

1 updated information that the agreement states have had.

2 COMMISSIONER ROGERS: So the format for reporting  
3 would sort of provide the uniform basis?

4 MR. PETTIJOHN: The format for reporting would  
5 provide the basis for getting the same level of information.

6 MR. ROSSI: I think we have worked very hard to  
7 ask the agreement states to try to report in a very similar  
8 manner to the kind of reports that we get from our own  
9 licensees. Of course that has been voluntary but that's  
10 been our goal.

11 CHAIRMAN JACKSON: And so the weighting is  
12 similar, of the types of events that end up being reported?

13 MR. ROSSI: Oh, yes, the types of events are quite  
14 similar that are reported both promptly and routinely.

15 CHAIRMAN JACKSON: And the seriousness weighting  
16 is comparable?

17 MR. ROSSI: Right, yes.

18 MR. PETTIJOHN: Slide 12, please.

19 [Slide.]

20 MR. PETTIJOHN: The type of information that is  
21 desired for both NRC licensees and agreement state licensees  
22 is information that would fully describe events.

23 Not all of the desired information is really  
24 required to be reported by regulations, however in most  
25 event reports we are able to get most of the information



1 that we have listed both from -- well, from NRC licensees  
2 and by using a standard format for reporting we will also  
3 get this information from agreement states.

4 Slide 13, please.

5 [Slide.]

6 MR. PETTIJOHN: The Nuclear Material Events  
7 Database uses software that's been developed on the contract  
8 by the Information Resource Management Office. It's  
9 designed to, based on an agency-wide user interface that's  
10 used for other applications at NRC, and provides a level of  
11 standard querying and reporting. For infrequent users the  
12 system was designed to allow one who doesn't use it  
13 frequently to find information but for a skilled user to  
14 allow sufficient capacity for doing serious analysis work.

15 I have a screen that I would like to just display,  
16 one of the screens from the database, just to give a general  
17 idea of what type of interface that we have.

18 Can I have backup slide 1, please?

19 [Slide.]

20 MR. PETTIJOHN: Just very quickly, a few minutes,  
21 the database is a Windows-based system that allows what is  
22 called a drilldown effect where you can find the basic  
23 record and then would be able to find additional related  
24 information by clicking on an icon on the screen, so that if  
25 you wanted to, if you looked up a record and you wanted to

1 find the details of a medical misadministration or if there  
2 were equipment involved then you could click on those icons  
3 and this interface is as I said used in other applications  
4 at NRC.

5 Could I go to Slide 14, please.

6 [Slide.]

7 MR. PETTIJOHN: The contractor for the Nuclear  
8 Material Events Database is the Idaho National Engineering  
9 Laboratory and a critical aspect of the database is how  
10 timely the information is entered into the database. The  
11 contractor is on both the active databases that the  
12 operations center creates from events that are called in to  
13 the NRC and also the contractor is on distribution for the  
14 regulatory information distribution system.

15 They pull the events off from the databases that  
16 the operations center creates and also from the preliminary  
17 notification databases on a daily basis and those into the  
18 database and they have a requirement in their task to enter  
19 information within 72 hours that is received through the  
20 Regulatory Information Distribution System or RID system.

21 Next slide, slide 15, please.

22 [Slide.]

23 COMMISSIONER ROGERS: They enter the agreement  
24 state data also?

25 MR. PETTIJOHN: Yes. The agreement state data

1 also. The agreement state data is just starting to be  
2 received through the RID system. Prior to that we would  
3 forward event reports directly to the contractor as we  
4 received them.

5 The normal quality checks are done in data entry.  
6 In addition, the AEOD staff has assigned responsibilities  
7 for looking at event reports, the same event reports that go  
8 into the database. We have the events tracking system that  
9 mimics the database in terms of the actual number of events,  
10 not the content, but we record and look at the events.

11 That serves, although that is not the primary  
12 purpose of it, it does serve as a QA check and we also  
13 compare with things such as other event sources -- the NMSS  
14 monthly events briefings.

15 Any new information that is received once an event  
16 is entered into the database, for example through receiving  
17 the report that is called into the operations center, as  
18 additional background information is received that  
19 information is used to update the database record.

20 Slide 16.

21 [Slide.]

22 MR. PETTIJOHN: Just to cover the scope of areas  
23 that are covered by the Nuclear Material Events Database,  
24 essentially programs that are not commercial power reactors  
25 and not safeguards information, are included.

1           The type of events that are included are based on  
2 the reporting requirements and tend to be not as many things  
3 that are precursors as they are things that have actually  
4 occurred, such as an overexposure or someone has lost  
5 material.

6           The reporting requirements don't include -- there  
7 are not a lot of reporting requirements for materials  
8 involved in precursor information.

9           Also we receive events that are reported  
10 voluntarily that don't necessarily meet a requirement and  
11 that is somewhere approximately about 20 percent of the  
12 events or so. Usually they are the same events except they  
13 just lower the threshold for reporting.

14           Slide 17, please.

15           [Slide.]

16           MR. PETTIJOHN: Just further looking at the areas  
17 that are covered, there are about 12,000 records in the  
18 Nuclear Material Events Database that go back to 1981 and  
19 that is based on agreement state information being in the  
20 database from about 1991 through the current time and that  
21 is out of about 23,000 licensees over that time period.

22           The database, as I say, goes back to 1991. The  
23 agreement state data we started putting in 1991. One note  
24 is that the data prior to 1990 did not conform to the data  
25 structure of the new database and so all the records are not

1 necessarily complete. We reread or recoded records from  
2 1990 forward for the database.

3 Slide 18, please.

4 [Slide.]

5 MR. PETTIJOHN: Until the Nuclear Material Events  
6 Database is installed at local workstations, access to the  
7 database was through request to AEOD and beginning -- which  
8 is about now -- in December we are expecting to have the  
9 database installed in headquarters and that would mean the  
10 Staff would be able to access the database -- those Staff  
11 that have signed up to be users would be able to access the  
12 database through the AUTOS network.

13 CHAIRMAN JACKSON: Excuse me. So then in having  
14 the database installed at headquarters, who then will be  
15 maintaining the database?

16 MR. PETTIJOHN: Okay, the contractor, Idaho, will  
17 continue to maintain the database and they provide a upload  
18 each day in the immediate future and then in the long-term  
19 they will actually be on-line and provide the updates  
20 directly in the database. They will still maintain it but  
21 it will have access to it here.

22 CHAIRMAN JACKSON: Is there a reason they maintain  
23 the database and we don't?

24 MR. ROSSI: It's a matter of resources primarily.

25 CHAIRMAN JACKSON: So it's more cost efficient to

1 have them maintain it than to have us?

2 MR. ROSSI: Well, I think it is availability of  
3 resources up to this point in time.

4 MR. JORDAN: That is, to extract the data from the  
5 reports and do the quality checks we have found that that is  
6 a more cost effective way.

7 MR. ROSSI: That is not too different than what we  
8 do with the sequence coding and search system for the LERs  
9 by the way. That's also maintained by a contractor.

10 MR. PETTIJOHN: Slide 19.

11 [Slide.]

12 MR. PETTIJOHN: Because there were expecting just  
13 the normal delays in developing the final database system,  
14 an interim system was developed and provided to the  
15 agreement states in order to meet a commitment to provide  
16 the material event data to the agreement states as soon as  
17 possible.

18 This was a diskette-based system that was provided  
19 in late 1994.

20 The final system, which is the Windows system that  
21 I showed, the screen that I showed, will be provided  
22 initially to the agreement states as a stand-alone system  
23 and in the future as a system by which they can connect by  
24 way of a communication link such as Internet.

25 For both the systems, that is the interim system

1 that the agreement states now have in the diskette form and  
2 the future system, there is the capability for the agreement  
3 states to create reports and submit them electronically,  
4 primarily by E-Mail through the Internet.

5 Slide 20, please.

6 [Slide.]

7 MR. PETTIJOHN: Just an overall estimate of  
8 resources which were both contractor and Staff of about 300K  
9 annually in dollars, which was divided between two separate  
10 tasks.

11 One is the review and coding of information, which  
12 is done by the Idaho National Engineering Laboratory and the  
13 software maintenance is done by a separate contract that is  
14 managed by IRM.

15 In terms of staff, it's both the contract  
16 management staff for managing the contracts and for the  
17 various staff that participated in various aspects of  
18 quality assurance for the database.

19 CHAIRMAN JACKSON: Going forward as you  
20 standardize format and coding, is there the possibility of  
21 direct entry as opposed to having this going through a  
22 contractor?

23 I mean it seems that you are moving toward having  
24 a standard format and I understand the point about prior  
25 data.

1 MR. PETTIJOHN: Correct.

2 CHAIRMAN JACKSON: I am taking about data going  
3 forward. Is there any hope that there could be more direct  
4 entry into the database?

5 MR. PETTIJOHN: I certainly think so. Now with  
6 looking at some of the software that is available on the  
7 Internet for example like on the Worldwide Web, a lot of the  
8 forms that are used now, it looks like it was not going to  
9 be too long before something like this could be set up for  
10 event reporting.

11 MR. THOMPSON: We have stressed to the agreement  
12 states the importance of them being able to have Internet  
13 access and I think we have even been able to supply a few of  
14 the agreement states with computer capability to let them  
15 have that capability so our thoughts were along the lines  
16 that if the guidance were clear enough that then they could  
17 directly put information in.

18 Of course we would like to make sure there's  
19 consistency in the coding and a lot of that type of reviews.  
20 We'd want to make sure that there was a good understanding  
21 of that but that is further down the road I think that would  
22 be a reasonable expectation that we may be able to do that.

23 MR. PAPERIELLO: It's a little more complicated  
24 than just input.

25 The information on an event that you get doesn't



1     come in correct usually the first time around. In other  
2     words, what you know early-on in an event like the NIH event  
3     is a lot different three months later, so part of this  
4     process is ensuring that people are looking at the database  
5     and as we acquire more information the database is brought  
6     up to date.

7             We can do part of this and we already have in the  
8     inspection procedure we have for event follow-up. We  
9     indicate certain information that the inspectors have to  
10    gather that will match fields on this report, but now that  
11    we have this we'll just do another iteration of the  
12    inspection procedure, so it's sort of an iterative process.

13            I am very much concerned about my staff checking  
14    the events in the database against what we know about them,  
15    particularly when we get near the end of the process of the  
16    inspection report and the like to make sure that what is  
17    left in the database is in fact the up-to-date information  
18    and not the preliminary notification, which many times is in  
19    error -- not deliberately, just that people don't have the  
20    full information, so that iterative process is an important  
21    part of this thing to get a good database.

22            CHAIRMAN JACKSON: No, I appreciate that. I guess  
23    I am just trying to understand the playoff between what your  
24    staff is going to be doing anyway however the data is input  
25    versus, you know, how it is actually inputted and taking

1 advantage of technology and coding and software upgrades,  
2 that kind of thing.

3 MR. PAPERIELLO: Well, if we give our inspector  
4 hand-held ThinkPads they can --

5 [Laughter.]

6 CHAIRMAN JACKSON: Well, we could talk on and on  
7 but the point is that I hear you saying two things.

8 I hear you saying that the data gets inputted to  
9 the database and you have older data obviously that you have  
10 to worry about massaging and getting into some form that  
11 makes sense for the uses you intend to make of it.

12 But then going forward I also hear you saying  
13 there are advances in software and the like that piques my  
14 interest in terms of making use of the technology in terms  
15 of efficiency of reporting, but I hear you secondly saying  
16 that, okay, that your staff has to look at it to make sure  
17 it is up-to-date, final form, and so on, but that is  
18 presumably something that you have to have to see that your  
19 staff does irrespective of how it got into the database in  
20 the first place, and that's all I'm really getting at.

21 MR. JORDAN: I would comment further. I believe  
22 that the agreement states, a large number, will be putting  
23 in their data directly, hopefully in the not-too-distant  
24 future.

25 We partly sold this to the agreement states as a

1 voluntary program for reporting so that they would have  
2 access and so they really have I think partnered effectively  
3 with us on going about this.

4 In the long term, way down the line, I would hope  
5 that the licensees, the larger licensees would submit their  
6 reports in electronic format that would be easy for us to  
7 then transfer.

8 CHAIRMAN JACKSON: Right. I don't think we are  
9 really disagreeing --

10 MR. JORDAN: Right.

11 CHAIRMAN JACKSON: I think what you are talking  
12 about in terms of even at the agreement state level, how  
13 they would input the data is consistent with what I am  
14 talking about.

15 MR. JORDAN: Right. It is an evolution and we are  
16 certainly gearing for it.

17 COMMISSIONER ROGERS: Just one cautionary note.

18 I think a little thought has to be given to the  
19 security of the system as well.

20 I mean if it is just a wide-open database I think  
21 one has to think a little bit about --

22 MR. JORDAN: Agreed.

23 COMMISSIONER ROGERS: -- misinformation being  
24 entered into it or mischievous acts or games being played  
25 with it -- some thought.

1 MR. JORDAN: Right. IRM has provided those  
2 controls so it's --

3 CHAIRMAN JACKSON: That has to be any time you  
4 immediately have an Internet access, however the data is  
5 entered you have to worry about that.

6 MR. PETTIJOHN: Okay. Slide 19, please -- I'm  
7 sorry, Slide 21.

8 [Slide.]

9 MR. PETTIJOHN: I'd like to spend the last part of  
10 the discussion on agreement state event reporting, which was  
11 one of the main objectives, improvements that were to be  
12 made with the new database and the agreement states  
13 essentially have reporting requirements that are the same as  
14 NRC, of the agreement state licensees, reporting to the  
15 agreement states essentially the same events as NRC  
16 licensees report to NRC.

17 Until 1991, as I said, the data were included only  
18 in ad hoc fashion and in 1991 there was a request that went  
19 out to the agreement states asking for event data to be  
20 submitted annually and initially about two-thirds of the  
21 states submitted information.

22 By 1992 essentially all the states were submitting  
23 the data on an annual basis.

24 In April of last year -- next slide, please.

25 [Slide.]

1 MR. PETTIJOHN: In order to encourage voluntary  
2 reporting a six-month trial program was implemented.

3 One of the issues that I guess was uncovered or  
4 understood about agreement state event reporting was that in  
5 many cases agreement states were not aware of what the  
6 requirements were in all cases and so part of the program  
7 was to provide specific guidelines to agreement states in  
8 terms of event reporting both in terms of things that were  
9 promptly to be reported and then routine events.

10 Next slide, please.

11 [Slide.]

12 MR. PETTIJOHN: The guidelines were included both  
13 in a draft handbook that was given to the agreement states  
14 and also we provided a computer program that allowed the  
15 agreement states to enter reports directly into a computer  
16 file that they could send either by diskette or by E-Mail to  
17 the contractor.

18 We spent time in workshops with the agreement  
19 states also in discussing the program and an evaluation of  
20 the program is planned for the early 1996 time period.

21 Next slide, please.

22 [Slide.]

23 MR. PETTIJOHN: We do have some preliminary  
24 results though, and that is we are getting more events  
25 called into the NRC Operations Center from Agreement States

1 and for 1995, essentially all the Agreement States have  
2 submitted some data. The Agreement States through informal  
3 discussions have all indicated that once they have the final  
4 software for the final systems that they are all interested  
5 in electronic reporting.

6 Next line --

7 MR. JORDAN: I would like to add a comment about  
8 the Agreement States, just for information. Along the way  
9 there was a discussion by the Agreement States indicating  
10 that they regulated non-Atomic Energy Act materials and that  
11 the events were similar and they voiced a concern that they  
12 would like to have a database that would accommodate those  
13 events. The database was constructed so that it could do  
14 that and we would store the data, but not queue lay it.  
15 They have chosen not to use that feature to any great  
16 extent, at this point. It was a design feature that helped  
17 the program go forward and it is available. We will just  
18 have to see how it lays out.

19 [Slide.]

20 MR. PETTIJOHN: The next slide is slide 25. This  
21 just covers, gives an overview, of the things that we have  
22 talked about in terms of when things began. In fact, the  
23 installation of the final system we are hoping to start this  
24 month within the NRC and in January to begin the  
25 installation of the system with the Agreement States. The

1 system with the Agreement States, I might point out, would  
2 include a data entry program, the final form of the data  
3 entry program for electronic recording of the next life  
4 lease.

5 Just to conclude, during the development of the  
6 database there have been a lot of exchange of information  
7 with the Agreement States. We are expecting the final  
8 result to show improvements in access to the database by the  
9 fact that the headquarters and regional staff will have  
10 access to the system by way of the AUTOS network. We have  
11 also seen improvements because of standardized coding and  
12 the quality of the information and we believe these things  
13 equate to, one to resource savings and also improvements in  
14 safety. We are able to consolidate a number of databases by  
15 having new Material Events Database as a centralized  
16 database and also because of getting complete information.  
17 For example, Agreement States reporting at the same monthly  
18 basis or as events occur, more timely review of all  
19 information on a national level, which can, we believe, lead  
20 to improvements in safety. Overall, we believe this will  
21 result in, also, us being more responsive to the public for  
22 information requests.

23 Those conclude my remarks.

24 MR. THOMPSON: That concludes the staff's  
25 presentation. We would be pleased to respond to any

1 questions that you have.

2 CHAIRMAN JACKSON: Let me ask you a few.

3 How amenable to you think the database will be, if  
4 not now, then ultimately for assessing the performance for  
5 the performance of the specific program. Do you envision  
6 that it would get to that point?

7 MR. THOMPSON: Assessing the performances of the  
8 Agreement States, for example, we would use information in  
9 here that assists us in evaluating what areas to look at in  
10 an Agreement State as part of the IMPEP program as well as  
11 our own regional offices and during rule making activities  
12 if there is a trend that identifies an area or a particular  
13 area they would be able to assist us in being able to do  
14 that type of work.

15 Carl, you may have some other views.

16 DR. PAPERIELLO: I believe that the database will  
17 be very effective in the instructions to my staff I  
18 encourage when we do the inspection to report the  
19 consequences of events. In other words, if somebody loses a  
20 source was there an exposure or was there a potential  
21 exposure or was it found again. If a gauge is damaged in a  
22 fire, what is the consequences in terms of exposures,  
23 leaking material, loss of facility. So you can report not  
24 only how many events you have but what the consequences are  
25 of every one of these events. So at the end of the year we



1 will know were people exposed, was material completely lost  
2 and represents potential exposure in the public domain, was  
3 there dollar value lost?

4 I think we really have a good story to tell,  
5 myself, but I don't believe that we get it out very well.  
6 We have, you know, what are the consequences, and I tell  
7 people zero is a very good result. I mean, if there is an  
8 event, but there is no injury to the public or material is  
9 recovered, that is perfectly okay. These can form the basis  
10 of output indicators.

11 CHAIRMAN JACKSON: So you might anticipate or do  
12 you think that there might be a way to produce some kind of  
13 periodic reporting that might give that kind of a overview  
14 picture?

15 DR. PAPERIELLO: Yes, certainly.

16 CHAIRMAN JACKSON: Did I also hear you say that  
17 you thought that this might be amenable to some kind of  
18 trending analysis?

19 MR. THOMPSON: I was the one that said the  
20 trending analysis, though I think Carl would support that.  
21 We have looked at those trends in the past and part of the  
22 difficulty is getting all of the states reporting the same  
23 type of events with the same criteria. We find ourselves  
24 right now having to have questions about, are all events  
25 being reported and, for example, some states have adopted

1 certain reporting requirements and we go through our normal  
2 efforts to have compatible regulations in reporting, but it  
3 does give us that capability and it also gives us the  
4 capability that if something seems like one state is not  
5 reporting things to explore. Maybe they are doing something  
6 very good in that state that is a good practice that we  
7 should have other states know or maybe their licensees have  
8 not gotten the word that they are supposed to be reporting  
9 events. So, I mean, it is a very useful information tool.

10 CHAIRMAN JACKSON: Are there any other areas? I  
11 mean, in a certain sense, you have implicitly just done  
12 that, but are there any other areas that you think might be  
13 improved upon in terms of working with the Agreement States  
14 or obtaining the Agreement States data in the form that you  
15 would like?

16 MR. THOMPSON: I think I will let --

17 MR. BANGART: I might add that the database is  
18 going to be useful in continuing to assess whether or not  
19 the Agreement States are fully reporting and passing on  
20 their licensee reports to us. For example, we have a North  
21 Carolina program review going on right now and the team did  
22 get a print out from NMED of all the reports that have been  
23 submitted by the State of North Carolina and while they are  
24 there they will then be able to compare that against the  
25 actual reports from licensees that exist in North Carolina

1 files and they will be able to assess whether or not they  
2 are passing on completely all the data that they have.

3 MR. ROSSI: You know, this database will do  
4 another thing for us and that is that it will help us to  
5 look and see what the common causes for certain types of  
6 events are and feed that information back to the users like  
7 medical people and other licensees. The kind of examples  
8 that we have so far is that in the area of medical  
9 misadministrations we have looked and we find that the  
10 number of reported misadministrations that involved  
11 treatment planning has been higher than that associated with  
12 the dose delivery process. The apparent reason is that  
13 multiple patients are more likely to be effected in  
14 treatment planning than in the dose. So we find things like  
15 this and then we are looking for ways to feed that  
16 information back to the medical profession in this  
17 particular case so they know where best to focus their  
18 efforts to try to further reduce errors.

19 CHAIRMAN JACKSON: How can you get at, how do you  
20 assure yourselves, that the data you get from the Agreement  
21 States is complete or that you are getting reported what  
22 needs to be reported?

23 MR. BANGART: Well, it is a sampling process.  
24 Handling of response to events and allegations that they  
25 receive is one of the major common performance indicators,

1 now, of the five. We do a selective sampling of all of the  
2 events that are received by an Agreement State program  
3 during the review period and then we follow not only how  
4 they responded, but whether the licensee reported, whether  
5 the Agreement State required the licensee to report all the  
6 information that is required in their own equivalent  
7 regulations.

8 CHAIRMAN JACKSON: It is like a kind of an audit?

9 MR. BANGART: Yes, exactly.

10 MR. THOMPSON: The part of it where we don't have  
11 as good feel for is we don't go out and do inspections to  
12 see if there were events at a facility that they knew about  
13 that they didn't report. In fact, in the QM Rule one of the  
14 things that we kind of have is a process where the licensee  
15 goes back and looks at the thing and see if they had some  
16 events that should have been reported over the past year.

17 CHAIRMAN JACKSON: It is kind of an iterative  
18 process?

19 MR. THOMPSON: It is an iterative process and, of  
20 course, by the more we have the ability to communicate to  
21 the states and they have the ability to communicate to their  
22 licensees the importance of these reporting events, I think,  
23 the better it will be. Obviously, we tend to have more  
24 reports per licensee in general than the Agreement States  
25 and that always has been an enigma to some of us.

1                   CHAIRMAN JACKSON: Commissioner Rogers?

2                   COMMISSIONER ROGERS: Just on that point, one of  
3 the problems has been that we know how many events have  
4 taken place, but we don't know out of how many activities  
5 those events have come. In other words, what is the  
6 denominator in the fraction? Do you see this as cracking  
7 that problem at all, in any way?

8                   MR. JORDAN: No, this is really a frequency rather  
9 than a rate. So we will get an annual rate that we can look  
10 across a set of licensee and we will be able to trend that  
11 meaningfully, unless, let's say, the number of licensees  
12 changes during that time frame. But in terms of, like in  
13 medical practice, the numbers of instances per treatment, we  
14 will not have that or are not seeking it at this point.

15                  COMMISSIONER ROGERS: Right. I think it is very  
16 interesting to see this development, because for some years  
17 we, at the Commission, I think, have tried to get something  
18 like a general picture of what was happening out there and  
19 it looked very, very difficult to do and now, here it is, in  
20 a sense. I commend you, but I am also wondering what caused  
21 things to move so rapidly and satisfactorily, any events in  
22 the last couple of years that did that, because I know,  
23 years ago, NMSS simply told us it was just an impossible job  
24 to do to collect this kind of data. Now it looks like we  
25 are getting good response from the states here. They must

1 see some quid pro quo here.

2 MR. JORDAN: It was a good cooperative effort.  
3 The offices and the states sort of come together, I think,  
4 with some external issues, external events. Now our excuses  
5 are being reduced, we won't be able to tell you next year  
6 that we don't have the data. We may tell you we don't  
7 understand it, but we will have the data.

8 CHAIRMAN JACKSON: Well, that's part of this.

9 MR. THOMPSON: I think the promise of the  
10 Commission's continued attention to this area --

11 CHAIRMAN JACKSON: He's fishing for compliments.  
12 [Laughter.]

13 MR. THOMPSON: No, but seriously, it is the  
14 attention that you put on the area --

15 COMMISSIONER ROGERS: It did cause some  
16 frustration. We weren't getting anywhere at all for some  
17 time and now, now it looks like you've for it.

18 MR. THOMPSON: But it did take the commitment by  
19 the offices for the state programs and NMSS and AEOD to put  
20 it all together and with the existence of IRM and, you know,  
21 our computer systems have been --

22 DR. PAPERIELLO: Technology has advanced to the  
23 point where --

24 MR. THOMPSON: So it kind of all comes together  
25 where we are able to do that and then it is not so onerous

1 on the state or so onerous on us trying to manually do much  
2 of this in a very laborious way. It is much more cost  
3 effective, given the electronics, then we have a good input  
4 on it.

5 MR. JORDAN: I would like to give Sam Pettijohn  
6 for having been instrumental in bringing it together and  
7 being very, I would say, convincing in meeting with the  
8 Agreement States. He has participated in a number of  
9 workshops with the Agreement States and has managed the  
10 contract directly. So he has done a good job.

11 MR. BANGART: The Commission's directive to the  
12 staff, also, to consider establishing a formal binding,  
13 legally binding, requirement on the Agreement States to  
14 report this data was viewed by the states as a message that  
15 they did not receive well and they much preferred the  
16 voluntary reporting method and I think with the knowledge  
17 that if their reporting did not improve that there could be  
18 a regulation requiring such reporting did indeed provide a  
19 strong degree of motivation.

20 CHAIRMAN JACKSON: Sometimes that works.

21 MR. BANGART: That is why we hope, or they will  
22 hope, that this trial pilot program for six months turns out  
23 to be a success.

24 COMMISSIONER ROGERS: Just a gratuitous  
25 observation that when you do start to try to analyze the

1 data coming out of the database and look at events, I would  
2 think it might be interesting to keep in mind the  
3 possibility that we may have gotten in some cases to the  
4 point where, really, they are random events. That they are  
5 really random and that there isn't going to be a big message  
6 coming out of them other than that there always will be a  
7 certain number of accidents.

8 MR. JORDAN: I have to admit that we have a  
9 current study that has just been done in the radiography  
10 area and that at this point it certainly seems that they are  
11 random events, because we were trying to connect the change  
12 in numbers of exposures with respect to the radiographers  
13 wearing the self monitoring dosimeter with respect to us  
14 sending out a videotape for training and a number of other  
15 things that have changed and including the issues of a large  
16 number of information notices, generic correspondence. We  
17 don't see anything at all at this point. The numbers and  
18 the trends just are too random, but it does not stop us from  
19 looking and trying to see those correlations.

20 COMMISSIONER ROGERS: Absolutely, absolutely.

21 MR. ROSSI: And, presumably, by feeding back the  
22 kinds of things that are causing problems we would hope that  
23 it would at least get the message through to some of the  
24 radiographers, for example, on where to put their emphasis  
25 to try to avoid overexposures.



1           CHAIRMAN JACKSON: Well, thank you very much Mr.  
2 Thompson, Mr. Jordan, Mr. Rossi, Mr. Pettijohn, Mr.  
3 Paperiello, Mr. Bangart and Ms. Larkins. This has been a  
4 very enlightening presentation and, as I said earlier,  
5 obviously the materials area that we regulate is a rather  
6 diverse group of activities and it is hard sometimes to get  
7 our arms around. As they say it is like herding cats. But  
8 the database that you are developing will go a long way to  
9 allowing us to perform analyses and to understand what is  
10 going on. So we encourage you to continue.

11           Commissioner Rogers caveat notwithstanding, I  
12 would like to share with you the fact that the SEC has  
13 electronic reporting requirements for the companies that are  
14 under and that is a huge universe and it does require  
15 security arrangements and the like. Nonetheless, it is a  
16 requirement that the SEC decided would make their job easier  
17 and so the fact that you have been able to get this off the  
18 ground and this far along on a voluntary basis is good. So  
19 keep it up. Thank you.

20           MR. THOMPSON: Thank you.

21           MR. JORDAN: Thank you.

22           [Whereupon, at 2:58 p.m., the commission meeting  
23 was adjourned.]

24

25

CERTIFICATE

This is to certify that the attached description of a meeting of the U.S. Nuclear Regulatory Commission entitled:

TITLE OF MEETING: BRIEFING ON MATERIALS EVENTS DATABASE  
- PUBLIC MEETING

PLACE OF MEETING: Rockville, Maryland

DATE OF MEETING: Tuesday, December 12, 1995

was held as herein appears, is a true and accurate record of the meeting, and that this is the original transcript thereof taken stenographically by me, thereafter reduced to typewriting by me or under the direction of the court reporting company

Transcriber: Rosalie Gershon

Reporter: Mark Mahoney



# **NUCLEAR MATERIAL EVENTS DATABASE**

**Edward L. Jordan  
Samuel L. Pettijohn**

**December 12, 1995**

**Office for Analysis and Evaluation  
of Operational Data**

# TOPICS

- **Introduction**
- **Current Process**
- **Use of Material Event Data**
- **Historical Perspective**
- **Need for Improved Nuclear Material Events Database Identified**
- **Objectives for NMED**
- **Development of NMED**
- **Overview of NMED Operation**
- **Agreement State Event Reporting**
- **Milestones**
- **Conclusions**

# **Introduction**

- **Purpose for Maintaining a National Nuclear Material Events Database**
  - **Learn from experience of others**
  - **Learn from minor problems**

# **Current Process**

- **Collection of information**
- **Initial screening, review, and coding**
- **Material events database**
- **Analysis of events**

# **Use of Material Event Data**

- **Study potential generic safety problems**
- **Identify precursors of more significant events**
- **Feedback lessons from experience to industry**
- **Trend safety performance**
- **Input to Integrated Materials Performance Evaluation Program (IMPEP) reviews**
- **Input to inspections/investigations**
- **Input to rulemaking**

## **Historical Perspective**

- **Since 1981, AEOD has maintained databases of nuclear material events**
- **Initial databases were characterized by:**
  - **limited (flat file) data structure**
  - **non-standard coding of events**
  - **not directly accessible by staff**
  - **did not formally include Agreement State data**



## **Need for Improved Nuclear Material Events Database (NMED) Identified**

- **Need for improvements in collection of material event data identified**
  - **AEOD Annual Report**
  - **Study on medical use of byproduct material by C. Paperiello**
  - **IG Report**
  - **GAO Report**
  - **EDO Task Force Report**
- **As a result, two areas for improvement were addressed**
  - **Improvements in the NMED**
  - **Improvements in Agreement State event reporting**

## **Objectives for NMED**

- **Data structure to accommodate detailed record of an event**
- **Collection of comparable data in the same format for both NRC and the Agreement State Program**
- **Accessible source of material operating experience**
- **Consistent coding of events**

## **Development of NMED**

- **AEOD lead office for development of NMED**
- **Input from headquarters program offices, regional offices, and Agreement States**
  - **Written request for information**
  - **AEOD/OSP sponsored workshops on event database development and event reporting**

# **Overview of Operation of NMED**

## **(Collection of Event Data)**

- **NRC Data**
  - **Prompt notification (event notifications, preliminary notification of occurrence, morning reports)**
  - **Required licensee follow-up written reports**
  - **Event information from NRC inspections/investigations**

## **(Collection of Event Data Cont.)**

- **Agreement State Data**
  - **Prompt notification (event notifications, preliminary notification of occurrence, morning reports)**
  - **Monthly/quarterly/annually - event reports submitted to NRC by Agreement States**
- **Goal - Electronic reporting of events**

## **(Collection of Event Data Cont.)**

- **Event Record**
  - **General information (who, what, when, where), cause, contributing factors, corrective actions**
  - **Event detail (misadministration, overexposure, contamination), reporting requirements**
  - **Equipment information (system and component)**
  - **Consultant information, personnel demographics, document list**
  - **Event description (abstract)**

# **Overview of NMED (Function)**

- **Agency-wide user interface**
- **Standard querying and reporting**
- **Easy on-line look-up of information by infrequent users**
- **Adhoc query and reporting capabilities for skilled users**
- **Data entry (Agreement States only)**

# **Overview of NMED**

## **(Coding of Event Data)**

- **Timely entry of data**
  - **Contractor has on-line access to event notification, preliminary notification of occurrence, morning reports databases**
  - **Contractor is on distribution for event-related documents including inspection reports**



# **Overview of NMED**

## **(Data Quality Assurance)**

- **Data validation during data entry**
- **Secondary review of event coding**
- **AEOD performs review of events**
- **Checks against other data sources (NMSS monthly events briefing, Radiation Exposure Information Reporting System [REIRS])**
- **Event records are updated as additional information becomes available**

# **Overview of NMED**

## **(Scope of Data Included in NMED)**

- **Events for facilities licensed under 10 CFR Parts 30, 40, 50, 70, and equivalent Agreement State regulations**
  - **Events reported include radiation overexposures, medical misadministrations, lost material incidents, leaking sources, contamination incidents, equipment problems, potential criticality events, and transportation incidents.**
- **Events voluntarily reported by licensees or members of the public**

## **(Scope of Data Included in NMED Cont.)**

- **Program areas include:**
  - **Medical, academic, industrial,**
  - **UF6 and fuel facilities, and enrichment facilities (future)**
  - **Research and training reactors**
  - **Radiation overexposures (since 1993) for commercial reactors**
- **NRC material event data are from 1981 to present;  
Agreement State data are from 1991 to present**
- **Data prior to 1990 do not conform to newly created data structure.**

## **Overview of NMED (Access to NMED Data)**

- **NRC Headquarters and Regional Offices**
  - **Currently, through request submitted to AEOD**
  - **Beginning about the end of December, via AUTOS Network**

## **(Access to NMED Data Cont.)**

- **Agreement States**
  - **Interim diskette based system provided to Agreement States in late 1994**
  - **Initial implementation of final system stand-alone database**
  - **Future direct access to NMED via Internet communications link**
  - **For both implementations, event reports can be created and submitted via PC diskette, electronically, or in writing, to NMED contractor**

# **Overview of NMED (Resources Estimates)**

- **Contractor**
  - Review and code events and maintain database
    - 200K annually
  - Software update and maintenance – 100K annually
- **Staff**
  - Contract management – .25 FTE annually
  - Support quality assurance – .5 FTE annually

# **Agreement State Event Reporting (General Overview)**

- **Agreement States have compatible reporting requirements**
- **Agreement State data included in the database in an adhoc manner prior to 1991**
- **In 1991 Agreement State data included in formal manner, 19 Agreement States reported**
- **Beginning 1992, all Agreement States reported annually**

# **Agreement State Event Reporting (Six-Month Trial Program)**

- **Objective**
  - **Encourage voluntary reporting**
- **Scope**
  - **Defined guidelines for prompt reporting of events**
  - **Defined guidelines for reporting routine events**
  - **Defined guidelines for screening material events for meeting abnormal occurrence criteria**



## **(Six-Month Trial Program Cont.)**

- **Initiated six-month trial program, April 1995**
- **Included in program:**
  - **Draft handbook on event reporting**
  - **Interim version of NMED data entry program**
- **AEOD/OSP Workshops on event reporting**
- **Evaluation of effectiveness of trial program**

# **Agreement State Event Reporting**

## **(Preliminary Results of Six Month Trial Program)**

- **Agreement States notify the NRC Operations Center or the Regional State Agreements Officer (RSAO)**
- **Essentially all twenty-nine Agreement States have submitted reportable data for 1995**
- **Agreement States indicate that they will participate in electronic reporting**

# **Milestones**

- **Began development of enhanced NMED, September 1993**
- **Contractor began coding material events, January 1994**
- **NMED software pilot test began October 1994**
- **Interim version of NMED software provided to Agreement States including data entry program October 1994, and April 1995**
- **Installation of NMED software throughout NRC scheduled to begin in early December**
- **Installation of NMED software in Agreement States scheduled to begin in early January**

# **Conclusions**

## **Major Accomplishments**

- **Extensive interaction with Agreement States to improve Agreement State reporting**
- **Headquarters and regional staff direct access to material event data**
- **Improvement in quality of material events data**

## **Results**

- **Resources savings and improvement in safety**
  - **elimination of duplicate effort (consolidation of multiple databases)**
  - **timely review of material event information on national level**
- **More responsive to public**