LICENSING SUPPORT SYSTEM

REVISED DATA SCOPE ANALYSIS

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TABLES AND FIGURES

1.0 INTRODUCTION

The purpose of this analysis is to review and update the information presented in the Licensing Support System Preliminary Data Scope Analysis (DOE, 1989a) to determine if significant changes have occurred in the projected number of pages to be loaded into the Licensing Support System (LSS). The analysis was performed in two steps. First the major sources of data were examined to determine the current (1990) information believed to be relevant to the LSS database and the rate at which that information is being accumulated. Second, a projected rate at which pages would be generated for LSS was developed from the current official schedule for the DOE OCRWM high level waste repository program. These factors were used to generate a new table of pages to be loaded into the LSS through the year 2009.

1.1 Background

The Licensing Support System Preliminary Data Scope Analysis was developed in early 1988 and provided an estimate of the LSS data base in August 1990 and projections through 2009 based on the following sources:

1) NNWSI Project Participants and Subcontractors

2) NNWSI ARS data base

3) OCRWM Headquarters ARS data base

4) NRC data base

5) Regulations

6) Commitments Tracking data base

In addition to these sources, an adjustment was added to account for an estimated under-representation of relevant topics. The final results, as presented as Table 8 of the LSS Preliminary Data Scope Analysis (completed in 1988), indicated a cumulative page count at the end of 2009 of between 30,947,000 and 40,567,000. Subsequent to the completion of that report an error was discovered in the table and a revised Table 8 was produced in the Licensing Support System Conceptual Design Analysis (DOE, 1989b) which shows an increase in the 2009 page count to between 32,191,000 and 42,216,000.

Upon further review of these figures, an additional mathematical error was discovered in the calculations of the projected data scope size in August 1990 as defined in the LSS Preliminary Data Scope Analysis. Item 7 of Table 7 (page 42) calculated the contribution of the ARS/OCRWM Headquarters documents to be 323,000 pages from March 1988 to August 1990, but the correct figure is 32,300

pages. Since the adjustment for under-estimation of topics (Item 13 of Table 7) was calculated as a percentage of the contributions from the various sources, it must also be corrected. This results in the 1988 estimate of pages in August 1990 to be lowered slightly to 8,705,000 pages for the low estimate and 10,705,000 pages for the high estimate. These corrected figures were then used to recalculate the projections for 1990 through 2009. The results are shown in Table 1-1, 1988 Projection of the Size of the LSS Data Base. Table 1-1 is then the correct basis for comparison with the current analysis.

1.2 Analysis of Contributions

It is helpful to review the projected sources of information for the LSS data base and their relative size. Based on the information from the LSS Preliminary Data Scope Analysis (DOE, 1989a) as corrected above, the major data sources for the size of the August 1990 data base and their relative contributions are summarized below:

1) NNWSI Project Participants and Subcontractors

   Estimated 1980 to August 1990 production at 4,233,000 pages, all of which was considered relevant to LSS.

2) NNWSI ARS Data Base

   Existing (1988) data base plus production to August 1990 estimated at 86,700 documents. In addition a backlog of 845,000 documents had not yet been entered into the system. At 8 to 10 pages per document, a judgement of relevance at 65% to 70%, and 60% considered to be non-duplicative of the NNWSI participants contribution, the total ranged from 2,906,000 to 3,913,000 pages.

3) OCRWM Headquarters Data Base

   Existing (1988) data base of 113,000 documents is supplemented by the estimated production to August 1990 of 29,000 additional documents and a backlog of 162,000 documents that had not yet been loaded into the system. At 5.8 pages per document, an estimated 20% relevance, and only 4% considered to be duplicated in the above contributions, the total Headquarters contribution is estimated at 338,000 pages.

TABLE 1-1. 1988 PROJECTION OF THE SIZE OF THE LSS DATA BASE

	LOW ESTIMATE		HIGH ESTIMATE	
Year	Pages Added During Year	Cumulative Pages At Year-End	Pages Added During Year	Cumulative Pages At Year-End
1990	830,000	8,982,000	1,100,000	11,533,000
1991	1,087,000	10,069,000	1,441,000	12,974,000
1992	1,428,000	11,497,000	1,892,000	14,866,000
1993	1,660,000	13,157,000	2,200,000	17,066,000
1994	2,009,000	15,166,000	2,662,000	19,728,000
1995	1,858,000	17,024,000	2,463,000	22,191,000
1996	1,635,000	18,659,000	2,167,000	24,358,000
1997	1,386,000	20,045,000	1,837,000	26,195,000
1998	1,037,000	21,082,000	1,374,000	27,569,000
1999	1,286,000	22,368,000	1,704,000	29,273,000
2000	1,170,000	23,538,000	1,550,000	30,823,000
2001	1,877,000	25,415,000	2,487,000	33,310,000
2002	1,236,000	26,651,000	1,638,000	34,948,000
2003	1,261,000	27,912,000	1,671,000	36,619,000
2004	1,327,000	29,239,000	1,759,000	38,378,000
2005	1,120,000	30,359,000	1,484,000	39,862,000
2006	415,000	30,774,000	550,000	40,412,000
2007	365,000	31,139,000	484,000	40,896,000
2008	365,000	31,504,000	484,000	41,380,000
2009	365,000	31,869,000	484,000	41,864,000

4) NRC Data Base

The existing data base plus backlog in 1988 was estimated at 50,000 documents plus an additional 17,400 document estimated to be generated between 1988 and August 1990. At 7 pages per document and an estimated 90% relevance, the total contribution to the August 1990 data base is 425,000 pages.

These data sources are summarized in Table 1-2, along with the minor contributions from the regulations and commitment tracking, and the relative percentage of these sources are shown.

TABLE 1-2. CONTRIBUTIONS TO THE AUGUST 1990 DATA BASE PROJECTION

	LOW ESTIMATE		HIGH ESTIMATE	
	Pages	Percent	Pages	Percent
NNWSI Project	4,233,000	49	4,233,000	40
NNWSI ARS	2,907,000	33	3,913,000	36
Headquarters ARS	338,000	4	338,000	3
NRC	425,000	5	425,000	4
Misc	11,000	0	12,000	0
Adjustment	791,000	9	1,784,000	17
Totals	8,705,000		10,705,000	

From the above, it can be seen that the contributions from the Yucca Mountain project (Las Vegas) make up approximately 80 percent of the total. Therefore the accuracy of the figures from this source are more important than the accuracy of contributions from OCRWM headquarters, for example. The miscellaneous contributions from regulations and commitment tracking are smaller than the uncertainties in other contributions and can be ignored. (Commitment tracking has been eliminated from the LSS scope).

2.0 DATA BASE ESTIMATE, 1990

The first step in the analysis is to determine the size of the data base to be loaded into the LSS as of 1990 and the rate at which that number of pages of LSS material is growing. In order to evaluate this, the content of the major data bases that encompass information that is a candidate for inclusion into the LSS is examined, along with the associated growth rates, and an estimate of relevance and non-duplication is applied. No adjustment is applied for underestimation of topics as was done in the previous analysis. The topics to be included in the LSS were defined as a part of the negotiated rule-making process, and these definitions were used to assess the relevance factors that are applied in this analysis.

2.1 Yucca Mountain Project

Since the 1988 analysis, the Yucca Mountain Project Office has accumulated the products of the participating subcontractors and has entered, or is in the process of entering, records of these documents into the Records Information System (RIS) [formerly called the Automated Records System (ARS)]. Therefore it is not necessary to separate the Project Office source from the participating subcontractors. As of March 1990, the RIS contained approximately 100,000 records representing 1,725,000 pages (based on microfilm frame count). In addition to the records in the system, an additional 5,500,000 pages of information has been accumulated but not yet entered. New information is being accumulated at an average rate of 1500 records per week. Based on an average 17 pages per record (or document), the rate of new pages generated is 1,326,000 pages per year.

Much of the technical information in the Yucca Mountain data base was performed before the Quality Assurance Program was operative. Therefore it is difficult to ascertain whether or not this information will be entered into the LSS. In keeping with the philosophy of the 1988 analysis, the page count will be estimated as both a "low estimate" and a "high estimate". For the low estimate it is assumed that this technical data will not be entered into the LSS. With that assumption, it is estimated that only 10 percent of the project data base is relevant. For the high estimate, assuming the technical data is entered into the LSS, the relevance of this data is estimated at 75 percent.

For most of 1990, no significant technical analysis has taken place. Most of the generation of paper pertains to the development of strategies in the legal arena. Therefore it will be assumed that for both the low and high estimates, the percent relevance for 1990 is 10 percent.

In 1991 site work is expected to begin. When this work is in full operation, the information generated in the project is assumed to be 75 percent relevant to LSS. Therefore, from 1992 onward, the low and high estimates will be based on the assumption that 75 percent of the documents entering the Las

Vegas RIS will be entered into LSS. For 1991, a transition figure of 45 percent relevance is assumed.

2.2 DOE Headquarters

As of April of 1990, the DOE Headquarters RIS contained 192,402 records. On the basis of the number of microfilm rolls corresponding to those records, and using 3000 frames per roll, those records represent 1,205,000 pages or approximately 6.3 pages per record. Based on the first four months of 1990, the number of records processed per week (representing new document generation) are 358 corresponding to 5431 pages. (Note that this average number of pages per record for this period at 15.2 is significantly higher than the cumulative average to date of 6.3.) The annual rate of pages entered into the Headquarters RIS is then 282,000.

With respect to the applicability of the headquarters records to the LSS, the estimate is that only 15 percent of the RIS information would be relevant for material collected to date and until site work starts in 1991. After that time, there will be periods of time when the M&O Contractor will generate significant and relevant documents. Therefore, the relevance of documents will be estimated at 20 percent from 1992 onward for the low estimate, and 35 percent for the high estimate. For 1991 the figures will be 15 percent and 25 percent respectively. In addition, a factor of 0.9 will be applied to all pages from this source to account for an estimated 10 percent duplication of records with the Yucca Mountain Project contribution.

2.3 Nuclear Regulatory Commission

Estimates of documents and pages within the Nuclear Regulatory Commission data base (NEWDOCS) were received, calculating only those documents which are assumed to be non-duplicative and relevant to LSS. These figures are 157,500 pages currently cataloged and a rate of accumulation of 20,250 pages per year. These figures are significantly below the figures used in the previous analysis.

2.4 Total Contributions

Normalizing all data to the end of 1990, the summary of the contributions from the three major sources appears in Table 2-1. At the end of 1990, these estimates indicate that the candidate pages for the LSS range from 1,173,000 pages to 5,654,000 pages. The comparative figures from the 1988 analysis are from 8,982,000 pages to 11,533,000 pages.

Table 2-1. SUMMARY OF LSS DATA SOURCES

A. LOW ESTIMATE

	Yucca Mtn.	DOE HQ	NRC
Pages, end 1989	6,894,000	1,118,000	142,000
Relevance, pre 1990	0.10	0.15	1.0
Non-duplicative	1.0	0.90	1.0
LSS Pages, end 1989	689,000	151,000	142,000
Pages, 1990	1,326,000	282,000	20,000
Relevance, 1990	0.10	0.15	1.0
Non-duplicative	1.0	0.90	1.0
LSS Pages, 1990	133,000	38,000	20,000
LSS Contribution, end 1990	822,000	189,000	162,000

B. HIGH ESTIMATE

	Yucca Mtn.	DOE HQ	NRC
Pages, end 1989	6,894,000	1,118,000	142,000
Relevance, pre 1990	0.75	0.15	1.0
Non-duplicative	1.0	0.90	1.0
LSS Pages, end 1989	5,171,000	151,000	142,000
Pages, 1990	1,326,000	282,000	20,000
Relevance, 1990	0.10	0.15	1.0
Non-duplicative	1.0	0.90	1.0
LSS Pages, 1990	133,000	38,000	20,000
LSS Contribution, end 1990	5,304,000	189,000	162,000

3.0 DATA BASE GROWTH THROUGH 2009

Two factors affect the growth of the data base from 1990. As mentioned in the previous section, the relevance of the Yucca Mountain contribution will grow to 45 percent in 1991 and to 75 percent from 1992 through 2009. Similarly the relevance of the DOE Headquarters contributions will change with time in 1991 and 1992. More importantly there are phases in the project schedule when significant activities occur that result in increased generation of data that is candidate for inclusion into the LSS. Figure 3-1 illustrates that relative project activity and relates the activity to milestones in the project schedule as defined by DOE in November, 1989 (DOE, 1989c). This activity base does not include any milestones or activities relative to the Monitored Retrieval Storage (MRS).

From the project activity projection, the relative generation of candidate documents was calculated compared to the generation rate in 1990. Applying these project activity factor and the relevance factors results in a new estimate of pages for the LSS data base as a function of time. The results as shown in Table 3-1 may be compared with the previous results illustrated in Table 1-1. Figure 3-2 is a graphical plot of the cumulative pages at the end of each year for both the old and new estimates.

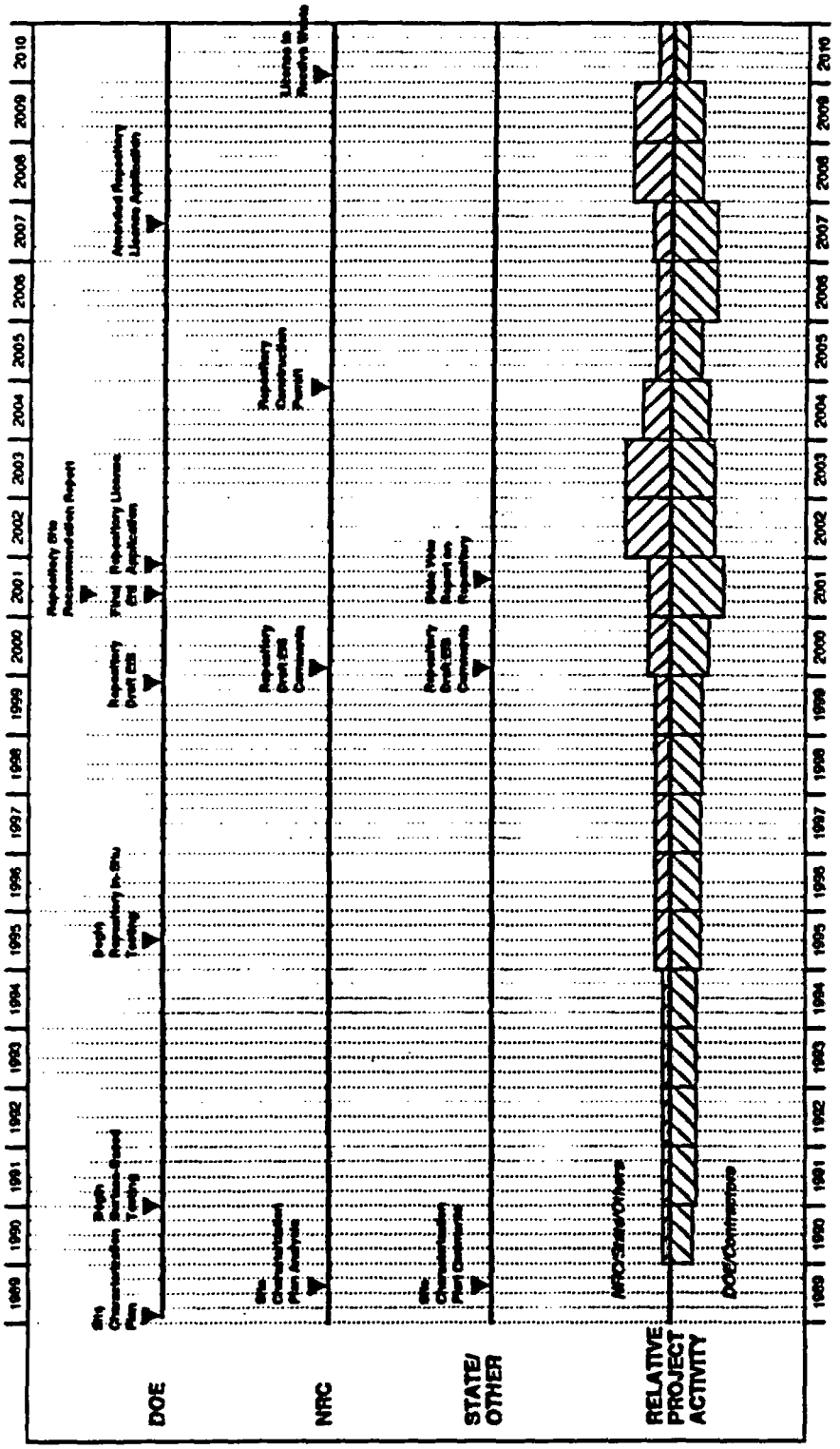

Figure 3-1. Formal Deliverables Impacting LSS

TABLE 3-1. 1990 PROJECTION OF THE SIZE OF THE LSS DATA BASE

	LOW ESTIMATE		HIGH ESTIMATE	
Year	Pages Added During Year	Cumulative Pages At Year-End	Pages Added During Year	Cumulative Pages At Year-End
1990	191,000	1,173,000	191,000	5,655,000
1991	688,000	1,861,000	715,000	6,370,000
1992	1,106,000	2,967,000	1,159,000	7,529,000
1993	1,106,000	4,073,000	1,159,000	8,688,000
1994	1,106,000	5,178,000	1,159,000	9,847,000
1995	1,580,000	6,758,000	1,656,000	11,503,000
1996	1,580,000	8,338,000	1,656,000	13,158,000
1997	1,580,000	9,917,000	1,656,000	14,814,000
1998	1,685,000	11,682,000	1,766,000	16,580,000
1999	1,685,000	13,287,000	1,766,000	18,346,000
2000	2,211,000	15,498,000	2,318,000	20,664,000
2001	2,633,000	18,131,000	2,760,000	23,424,000
2002	3,054,000	21,185,000	3,201,000	26,625,000
2003	3,054,000	24,239,000	3,201,000	29,826,000
2004	2,243,000	26,482,000	2,351,000	32,177,000
2005	1,580,000	28,061,000	1,656,000	33,833,000
2006	2,106,000	30,168,000	2,208,000	36,041,000
2007	2,159,000	32,327,000	2,263,000	38,304,000
2008	2,159,000	34,485,000	2,263,000	40,567,000
2009	2,159,000	36,644,000	2,263,000	42,829,000

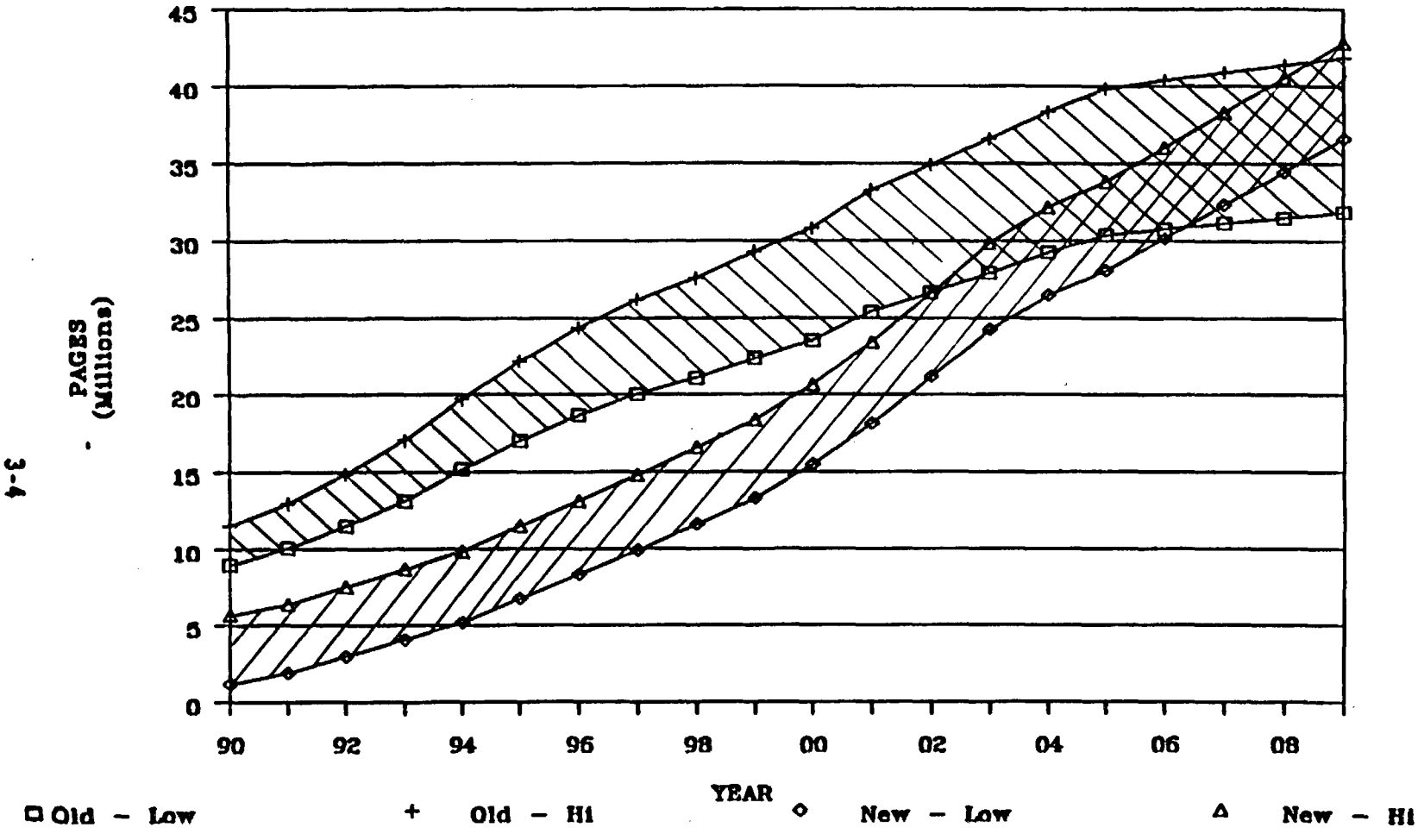

Figure 3-2. COMPARISON OF OLD AND NEW DATA SCOPE ANALYSIS

REFERENCES

DOE, 1989a; Licensing Support System Preliminary Data Scope Analysis, U.S. Department of Energy, Office of Civilian Radioactive Waste Management, DOE/RW-0210, January 1989

DOE, 1989b; Licensing Support System Conceptual Design Analysis, U.S. Department of Energy, Office of Civilian Radioactive Waste Management, DOE/RW-0211, January 1989

DOE, 1989c; Report to Congress on Reassessment of the Civilian Radioactive Waste Management Program, U.S. Department of Energy, Office of the Civilian Radioactive Waste Management, DOE/RW-0247, November 1989