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LICENSING SCHEDULE FOR AWAY-FROM-REACTOR (AFR) SPENT FUEL STORAGE FACILITIES

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PREPARED FOR THE U. S. DEPARTMENT OF ENERGY UNDER CONTRACT DE-AC09-76SR00001

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ABSTRACT

The Nuclear Regulatory Commission has authority to issue licenses for Away-From-Reactor (AFR) installations for the storage of spent nuclear fuel. This report presents a detailed estimate of the time required to prosecute a licensing action. The projected licensing schedule shows that the elapsed time between filing an application and issuance of a license will be about 32 months, assuming intervention. The legal procedural steps will determine the time schedule and will override considerations of technical complexity. A license could be issued in about 14 months in the absence of intervention.

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INTRODUCTION

Many power reactors are nearing their onsite storage capacity for discharged fuel. Storage of spent fuel at Away-From-Reactor (AFR) storage installations will allow reactors to continue to operate until facilities are available either for reprocessing or for ultimate disposal in a waste repository. AFR installations must be licensed by the Nuclear Regulatory Commission (NRC). Although wide experience in licensing reactors exists, the licensing of an AFR installation is a relatively new activity. Only one has been licensed to date. New regulations[1] developed specifically for AFR installations have recently been issued. This report reviews the requirements for licensing an AFR installation and projects a corresponding licensing schedule. These forecasts are needed for planning purposes in the overall AFR program.

A detailed licensing schedule was developed showing that approximately 32 months would elapse from the time that an application is submitted to the NRC until the license is issued. This time does not include either the time to prepare the license application, or the time consumed in the many unscheduled occurrences in the licensing process.

LEGAL ASPECTS OF LICENSING

The approaches for achieving AFR capability range from new construction to utilizing one or more existing commercial facilities. Attendant with this range of possibilities is a wide range of possible licensing actions: new proceeding, transfer of a current Part 70 license, transfer of a current Part 50 license, reinstatement of interrupted licensing proceedings, amendment to existing licenses, or other procedures. The approach chosen will determine the amount of work required for preparation of the license application. There also might be some significant time variations within the NRC for the staff review of the technical aspects of the application.

Nevertheless, there should be little variation in the indicated time schedule for the licensing itself, regardless of the complexity of the application. This situation occurs because licensing is an action that depends not on the technical magnitude

of the facility, but on some very specific procedural steps.[2] Thus, licensing is really a legal process by which the acceptability of a proposed technical operation is judged. A summary of the AFR licensing schedule is shown in Figure 1.

BASES FOR THE STUDY

The following six major bases were used in developing the time schedule for this licensing study report:

1. The structure of the schedule is derived from 10 CFR 2, "Rules of Practice for Domestic Licensing Proceedings." Regulations specifically applicable to an AFR (10 CFR 72) had not been promulgated at the time this study was made; NRC stated[3] that it was their intention to issue revisions to 10 CFR 2, as necessary, at the time the 10 CFR 72 regulation is promulgated. This action by NRC has been completed recently; the revisions to 10 CFR 2 are minor and do not invalidate the results of this study. Section 2.764 of 10 CFR 2 has been amended to provide that an initial license for an independent spent fuel storage installation [ISFSI] shall not become effective until review by the Commission has been completed. As a result, Commission review, shown as Steps 40-43 in Figure 2, becomes mandatory in initial licensing situations rather than being optional based on a petition.

2. It is assumed that the proceeding will be contested. Although a number of license amendments for expansion of fuel pool capacity at power reactors have been uncontested, most of the recent actions have been contested. For scheduling purposes, time must be allowed for contested proceedings.

3. Appeal processes were included, as provided for in 10 CFR 2, although it may be possible that some or all of them might not be used.

4. No time was allowed for miscellaneous delays such as: vacations, schedule conflicts (availability of all parties), objections, introduction of extraneous questions (that may not be able to be disposed of summarily), requests for more time to prepare, procedural questions, and rulings.

5. Some events (e.g., conferences) are shown as explicit licensing steps but without finite time because it may be anticipated that only one day will be required. Although they may take a few days - or even longer - this has not been reflected in the schedule.

6. The length of time was arrived at for those specific steps in the proceeding to which a finite time can be assigned in either of the two following ways:

   mandated - where 10 CFR 2 set specific requirements, the maximum time allowed was used ("within 15 days the parties will...."); shorter times are unlikely, longer ones are allowed by regulation.

   judgement - an estimate of a reasonable length of time that might be either shorter or longer.

LICENSING SCHEDULE

An analysis of the detailed licensing steps follows. It is from this detailed schedule that the summary of the licensing process shown in Figure 1 was developed.

The filing of a license application with NRC is the first step (shown as 1 in Figure 2) in the licensing process. This step will have been preceded by necessary preparatory work. Major steps include National Environmental Policy Act (NEPA) and Council on Environemntal Quality (CEQ) compliance, design work, and preparation of licensing application documents. The filing with NRC is governed by the Rules of Practice for Domestic Licensing Proceedings[2] in Sections 2.101 and 2.701; these and other applicable section numbers from the Rules of Practice will be shown in the detailed licensing schedule (Figure 2).

The NRC will review (2 in Figure 2) the license application for completeness (Section 2.102). If all the requested documents have been supplied and they appear to be reasonably complete, the review process may be completed in a time as short as 30-60 days. Quite frequently, the NRC will find that one or more rounds of questions to the applicant, and answers submitted either as revisions to the application or as supplementary information, are needed to make the application complete. This phase has stretched out to 12 months or longer in some cases.[4,5]

When the NRC finds the application in good condition and reasonably complete, they will open a docket (3) according to Section 2.702. This is the first point at which the licensing work becomes public with the placing of all documents gathered to date in the public domain. This is done by placing the docket in the NRC reading room in Washington, D.C., and also at a public place (courthouse or library) near the site of the proposed facility. A view held by some persons involved with licensing is that this step is the beginning of the licensing process. However, in this report, the earlier step of filing has been established as the start of licensing.

Upon a decision to open a docket and process the license application, the NRC will initiate two actions: an internal staff review (4) and the initial step in the external process (5). The internal staff review has been estimated by NRC to require about 12 months. The end result will be the publication of a Safety Evaluation Report (SER) based on the applicant's Safety Analysis Report (SAR) and an Environmental Statement (ES) based on the applicant's Environmental Report (ER).

The NRC will prepare a notice (5) indicating that they intend to take a proposed action and they are offering the opportunity for persons to request a hearing or to petition for leave to intervene in the proposed action. Section 72.34 of 10 CFR 72 indicates that the Commission will issue "a notice in accordance with either 2.104 or 2.105 as appropriate" without specifying which would be used in any particular AFR licensing action (i.e., "as appropriate" is not defined). Thus, step 6 on Figure 2 would reference either 2.104 or 2.105; there is no difference in time between these two possible courses of action. The time required to prepare the notice and have it published in the Federal Register (6) will probably be about 30 days.

The Rules of Practice (2.105 d, e) direct that 30 days must be allotted following the date of publication of the notice (6) during which time any person whose interest may be affected by the proceeding may file with the NRC a request for a hearing or petition for leave to intervene (7).

At this point (the end of the 30-day period in Step 7), licensing may go in either of two directions depending on whether any petitions were filed with the NRC. Should no potential intervenors step forward and file, the licensing proceeding becomes an uncontested matter, and the time limiting factor on NRC issuing a license is the staff review (4). At the end of that review, the NRC is empowered to issue the license (2.105 e). The uncontested action should consume about 14 months (Figure 2).

If, however, any intervention is forthcoming in that 30-day period (7), the more-lengthy schedule of a contested proceeding would apply (Figure 2). It should be noted here that the intervention may cease at almost any subsequent point along the remainder of the process shown in Figure 2. Intervention has been terminated in some cases of expansion of reactor fuel storage pools.[6-9]

The applicant and the NRC staff may file answers (8) to the petition(s) and are granted 10 days and 15 days, respectively, to do so. This step in the process ends with the issuing of an order granting full or partial permission to intervene or denying

permission to intervene. The issuance of the order is not shown in Figure 2.

An appeal process is provided by the NRC for licensing actions. Its utilization is authorized at various points in the proceeding by certain provisions in 10 CFR 2. Appeals, and briefs in opposition to appeals are submitted to and ruled on by the Atomic Safety and Licensing Appeal Board (ASLAB). The first opportunity to appeal (9) comes after the close of the petitioning process: the filing of petitions for leave to intervene (7) and answers to petitions (8). The NRC requires the appeal (9) to be filed within 10 days of the order and briefs in support or opposition (10) to be filed within 10 days of the service of the appeal. A ruling by the Appeal Board (11) is shown at the end of this 20-day period. What is not shown here is one possible further step in the appeal process -- that of appealing an order of the Appeal Board denying a petition (2.714 a (b)) or granting a petition (2.714 a (c)). This appeal of the appeal has no constraining time limits published in 10 CFR 2 but presumably might be governed by a similar 10-day period as was specified for the appeal.

Following the final ASLAB ruling (11) on intervention, the NRC will prepare a notice of hearing (12) specifying that the hearing process will begin with a special prehearing conference. It is anticipated that this action, like the first notice published, will consume about 30 days before the notice is published (13) in the Federal Register. This notice will include the designation of three persons to be the Atomic Safety Licensing Board (2.704) for the proceeding.

An assumption was made at this point in the analysis of the licensing process that a special prehearing conference (2.751 a) would be required. This assumption should be analyzed as no explicit guidance has come from the NRC on the utilization of this step in an AFR proceeding. The NRC has the option in simple licensing proceedings of ordering, as the first step, a prehearing conference (2.752) without utilizing the special prehearing conference (2.751 a). This would be analagous to stepping from Step 11 to Step 18 on Figure 2. There are three reasons why it is believed that the NRC would not use this shortcut:

- Different goals (discussed below) are achieved by each of the two conferences;
- Licensing of an AFR, certainly of the first one, would be perceived as important enough to not take any shortcuts; and
- In recent reactor pool rerack hearings -- an analogous but simpler action -- both conferences were utilized.[10,11]

Preparation for the special prehearing conference (14) may take as long as the 90 days allowed (2.751 a (a)) from the date that the Federal Register notice is published. The infrastructure of these preparations is not specified in Section 2.751 a, nor is it detailed in this report; it is partially covered in Section 2.714 of 10 CFR 2.

The special prehearing conference (15) has as its agenda (2.751 a):

1. Permit identification of the key issues in the proceeding;

2. Take any steps necessary for further identification of the issues

3. Consider all intervention petitions to allow the presiding officer to make such preliminary or final determination as to the parties to the proceeding, as may be appropriate; and

4. Establish a schedule for further actions in the proceeding.

The conference should consume only about one day. No finite time interval was shown on the schedule (Figure 2).

Following the conference, the hearing board will consider the record of the conference (16), enter an order (17) which recites the action taken (2.751 a (d)) and other matters, and have published a notice of the prehearing conference (18). Objections may be filed with the Board by parties within five days and by the NRC staff within 10 days, and the board may revise the order. This time interval is not shown in the schedule.

The process of discovery (19) is the major effort that will consume time between the two conferences (15 and 21). No time interval was specified in 10 CFR 2 within which discovery (19) should be completed and the prehearing conference (21) conducted, presumably because that schedule would have been set at the earlier meeting (15). An assumption was made for this study that a minimum of two months and more likely four months would be required to complete discovery. Discovery is a lengthy and specified (2.740 and Part 2, Appendix A, Section IV) process by which evidence is gathered by all parties for use in their presentations.

The Rules of Practice state that the prehearing conference shall take place within 60 days of the close of discovery. The full 60 days will probably be needed for preparation (20) as the materials obtained in discovery will need evaluation and the

conference will cover more matters of greater import than the earlier conference. The prehearing conference (21) is called to consider:

1. Simplification, clarification, and specification of the issues;

2. The necessity or desirability of amending the pleadings;

3. The obtaining of stipulations and admissions of fact and of the contents and authenticity of documents to avoid unnecessary proof;

4. Identification of witnesses and the limitation of the number of expert witnesses, and other steps to expedite the presentation of evidence;

5. The setting of the hearing schedule; and

6. Such other matters as may aid in the orderly disposition of the proceeding.

The conference may consume several days but was included in the overall schedule (Figure 2) as a one-day event.

Following the conference, the Board will consider the matters discussed at the conference. This consideration (22) should take about 30 days and result in the publication (23) of an order, or orders (2.752 (c)).

Objections (24) may be filed within 5 or 10 days by parties or the NRC staff, respectively. The final order (25) will be issued by the Board, and it will "control the subsequent course of the proceeding unless modified for good cause." While deliberating objections to its initial order, the Board is empowered (2.752 (c)) to certify for determination various matters to either the Commission or Appeal Board. No time was allotted in the schedule for this possibility, and it was assumed that the final Board ruling (25) would follow immediately the 10-day period allowed for filing objections.

At this point in the proceedings, basically all the preliminaries that govern, restrict, and define the actions to follow in the hearing have been completed. The hearing (27), in which the license applicant bears the burden of proof that he should be granted a license, is the major step in the licensing proceedings. All that has happened to this point might be viewed as preparation for the hearing and to some extent it is. But at last all the restrictions, contentions, and issues are known and now preparation (26) itself for the hearing may begin. It was estimated that

60 days would probably be allowed by the Board for preparation before the first day of the hearings (27) is scheduled.

There are definite rules and guidelines that cover the conduct of the hearing (27). These appear in 10 CFR 2 and Appendix A. However, the actual process and the time it will consume until the close of the record and end of the hearing (28) is very much an unknown at the outset. In a particular proceeding, once issues and contentions are known, one might make an estimate for that specific case. In general a schedule cannot be set. In this study, a time period of 3 months minimum to 6 months was allotted. This time is consumed more in delays, postponements, rescheduling, and other time consuming activities and less in the actual days when the board is sitting, the hearing is progressing, and testimony is being taken for the record. These latter activities may consume, even in strenuously contested cases, not more than 10-20 working days. The estimate of total time is, therefore, based more on the experience that applicants have had in the hearing portion of a proceeding, where many intervenor delaying tactics have been employed, than on any strict analysis of 10 CFR 2 or other NRC procedures.

Proposed findings and conclusions (29-31) may be sumitted by or called for from all parties. The party with the burden of proof (the applicant) is allotted 20 days in which to file (29); other parties (30) are allotted 30 days except for the NRC staff (31), which is allotted 40 days.

The right of reply to proposed findings by other parties is granted to the party with the burden of proof (32), but replies must be submitted within 10 days of the service of the proposed findings and conclusions.

All of the preceding material will be reviewed by the Atomic Safety and Licensing Board (ASLB) and its presiding officer (33), and an initial decision will be rendered (34). The deliberations leading to a decision and its publication are assumed to require 30 days.

At this point, the licensing action could be complete if no exception is taken to the inital decision. An estimated 28 months and a few days have been required to arrive at the initial decision according to the schedule derived in this study. The Commission is not authorized to issue the license until 45 days after the date of the initial decision at which time the decision becomes the final action of the Commission (2.760 (a)). Thus, nearly 30 months elapses before the licensing proceeding could be completed at its earliest.

If, however, an exception is taken to the initial finding by filing an appeal to the Commission (35), this filing must occur within 10 days of the date of the initial decision.

The exception must be backed up by briefs (36) to support it, and these must be filed within another 30 days, or 40 days in the case of the NRC staff.

Additional briefs may be filed (37) within 30 days (or 40 days for the NRC staff) of the filing of the appellant's brief, either in support of, or in opposition to, the exceptions stated in the first brief(s).

All of these appeals, exceptions, and briefs are filed with and reviewed by the Appeal Board (2.785) that acts for the Commission. It was assumed that the Appeal Board would conduct its review (38) in about 40 days and then render a decision (39).

This decision (39) would then come 32 months after the start of licensing (Figure 2).

There is one further, optional level of review that will be discussed in a moment, but should that review not be elected, the end of the proceeding is the decision (39) of the ASLAB. The license becomes effective immediately upon issuance of the decision (2.764 (b)) to issue a license within 10 days from the date of issuance of the decision. This NRC so-called doctrine of "immediate effectiveness" (2.764) has been affected by the accident at Three Mile Island (TMI), and the Commission has suspended its use in certain cases (10 CFR 2, Appendix B). It appears that the suspension applies only to nuclear power reactors, and if that is true, there will be no adverse effect on an AFR. If, on the other hand, the Licensing Board, Appeal Board, or Commission should cause this suspension to be applied, its effect on the licensing schedule would have to be included.

The final appellate possibility (40-43) is that of petitioning directly to the Commission for review of the Appeal Board decision. The appeal (40) must be filed within 15 days after an Appeal Board decision. Any other party to the proceeding has 10 days in which to file an answer opposing Commission review (41). After another 10 days (20 from the filing of the petition), the Commission will decide whether to grant the petition or not (2.786 (b)(5)).

If a review is ordered, the Commission may direct that briefs (42) be filed. It is assumed that 30 days would be allowed for briefs and answers. An alternative is for oral argument, but preparation for that and the scheduling of a time and place for such presentations might consume nearly as much time.

Following this, it is assumed that the Commission would complete its review (43) in another 30 days, and the final action would then be taken. This comes at about 35-1/2 months after the start of licensing. It should be noted that the Commission, in promulgating 10 CFR 72, made this Commission review mandatory for an initial AFR license.

ADDITIONAL SCHEDULE INFLUENCES

The time needed to complete a license review and application may also be influenced by factors within the NRC which are discussed in this section of the report. Even though these are not amenable to being quantified, an awareness of them may lead to a better understanding of the process as licensing plans are developed and also as progress is made through the actual licensing action. Some items ostensibly applicable to reactor licensing (10 CFR 50) so dominate the licensing picture that they may spill over and influence the AFR licensing under part 72.

All licensing work at the NRC is in a state of flux as a result of the Three Mile Island accident. This influence might affect the licensing of an AFR.

Within the NRC staff, different organizations perform licensing reviews for different kinds of licenses:

Activity	Regulation	NRC Review Group
Power Reactor	10 CFR 50	Nuclear Reactor Regulation (NRR)
Materials Possession	10 CFR 70	Nuclear Material Safety and Safeguards (NMSS)
AFR	10 CFR 72	(see text below)

It has been indicated by NRC that an AFR license would be granted under part 72 and that the responsible office would be NMSS. There are several reasons why processing of an AFR license application by NMSS might consume an unknown amount of time:

1. Only one part 70 license has ever been reviewed and granted for an AFR (docket 70-1308, license number SNM-1265 for the Morris Operation of GE). The review on a second one for Barnwell Nuclear Fuel Plant - Fuel Receiving and Storage Station (BNFP-FRSS of AGNS, docket 70-1729) was completed, but the license has not been granted.

2. It is believed that NMSS will be the responsible office for part 72, but this has not been confirmed.

3. A part 72 license would have many more facility-related aspects to be reviewed than previous SNM licenses, where the major effort was on the material itself, and relatively less importance was attached to the facility. NMSS has said that a large amount of the facility review work would have to be done by branches and sections within NRR where experience from comparable portions of, or facilities in, reactors has been developed. The AFR application would thus have to compete with reactor document processing for priorities on staff time.

There are two additional factors that should be noticed. These are influences outside the specific licensing schedule (shown in Figure 2) and impact the overall project schedule before and after the licensing action. They are shown in Figure 1 as single line items before and after the 32 months for licensing. They are:

1. Design and License Application Preparation - It has been indicated[12] that the licensing process is a one-step action and that, therefore, all license application documents must be complete to a degree that approximates the Final SAR in a two-step power reactor licensing action.

2. Construction - There are certain activities that may not commence until a license has been issued,[13] and so no time saving of overlapping activities is possible in these cases.

COMPARISON WITH REACTOR RERACKS

Licensing experience has been gained in the many power reactor license applications and amendments processed by the NRC. Those amendments that relate to expansion of storage capacity by rerack at the reactor pool are probably as closely typical to what can be expected for an AFR as any NRC licensing activities. Therefore, this section of the report presents an analysis of that experience covering 58 licensing actions from December 1974 - the date of the first rerack application - through July 1980 - the end of the study period. (There were 15 license amendment applications for pool reracks still in progress as of July 1980.)

Of the 71 commercial power reactors in the U.S., 67 were included in an analysis of rerack activities, and 62 of those have been involved in licensing amendments for reracks. Four were excluded from the analysis because either they do not have LWR fuel (Ft. St. Vrain - HTGR; Hanford N-reactor - graphite) or they are not actively operating (Humboldt Bay, Indian Point-1). Thus, almost all the LWR power stations in the U.S. have been involved in licensing amendments for pool expansions at the reactor in the last six years (Table 1). Of the five that have not been, two have alternative storage locations to which they have authority to ship spent fuel, and three are believed to have achieved pool expansion prior to receiving the operating license, thus eliminating the need to go through the license amendment process. Action on pool rerack amendments has probably gone through a peak and is entering a slow period (Table 2) for the following reasons:

- Action has been taken at almost all existing reactors to increase their storage capacity
- Expansion of pools is being planned at many new reactors prior to receiving the operating license
- The Federal government is actively pursuing an AFR program

A second peak may occur:

- when current capacities approach depletion
- when rod storage is proven
- if the DOE AFR program is delayed or not authorized

The times shown (Table 1) to complete these amendments or times consumed so far for those still in progress may be taken as an indicator of the time that will be required to obtain an AFR license. Although the data are only summarized here, the study showed that:

1. A higher percentage of recent applications are being contested than earlier applications; thus, the amount of intervenor action seems to be increasing.

2. Contested applications consume more time than uncontested ones

3. No case tracks completely the detailed schedule (shown in Figure 2), but many elements in those cases where data are available track certain segments quite closely.

4. The more recently contested applications are consuming more time (24.1 months average and still not completed) than earlier contested applications (15.5 months average); thus the intensity of intervenor action seems to be increasing.

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3. Federal Register, Vol 43, No. 195, page 46309, October 6, 1978.

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9. Hatch - Federal Register, Vol 45, No. 84, page 28550, April 29, 1980.

10. Big Rock Point - Federal Register, Vol 44, No. 203, Pages 60179,-80, October 18, 1979.

11. Hatch - Federal Register, Vol 44, No. 206, pages 61121,2, October 23, 1979.

12. R. E. L. Stanford. "Status of ISFSI Rule, Guides, and Standards as of June 1, 1979." paper at ANS Annual Meeting, Atlanta, Georgia, June 4-7, 1979.

13. Reference 1. Section 72.31 (b).

APPENDIX A

OTHER AFR DOCUMENTS

This appendix presents a brief list of those documents that would govern the licensing of an AFR installation. The list is complete as of the time of publication; additions or deletions may be necessary following publication of other documents.

Documents other than 10 CFR 2 include:

Document	Status
Regulations	
10 CFR 72 - Storage of Spent Fuel in an Independent Spent Fuel Storage Installation	In effect: 12-12-80
Regulatory Guides	
3.44 - Standard Format and Content for the Safety Analysis Report to be included in a License Application for the Storage of Spent Fuel in an Independent Spent Fuel Storage Installation (Water-Basin Type)	In effect
3.XX - Content of License Application for ISFSI (title not known)	Planned
3.XX - Guide to a list of Regulatory Guides applicable to an ISFSI (title not known)	Planned

Document	Status
Standards	
ANS-57.7 - Design Criteria for an Independent Spent Fuel Storage Installation (Water Pool Type)	Draft (2/79)
ANS-2.19 - Siting of an Independent Spent Fuel Storage Installation (title not known)	Draft

Additional Regulations

The following Parts of Title 10, Chapter 1 are believed also to apply in some measure to the Licensing:

20, 21, 30, 40, 50, 51, 70, 73, 75, 140

TABLE 1

Rerack Experience in LWR Fuel Storage Pools

Number of commercial power reactors:*

in U.S.	71
included in survey**	67
involved in reracks	62
not involved in reracks	5

Number of rerack applications:

initiated	58	(62)†
completed	43	(57)
still in progress	15	(18)
second time at one site	10	(15)
third time at one site	1	(2)

	Licensing Time, months	
Completed Applications	Average	Range
34 uncontested	12.0	3-32
5 contested, settled without hearings	13.2	9-17
4 contested, with hearings	15.5	10-23
Applications Still in Progress††		
7 contested	24.1	11-33
8 status not known	18.5	7-31

* Does not include reactors under construction or with low-power licenses

** Reactors excluded: Ft. St. Vrain, Hanford N, Humboldt Bay, Indian Point-1

† Value in parentheses is number of reactors

†† Time for actions still in progress is through July 1980.

TABLE 2

Timing of LWR Rerack Applications

	Number of Applications in Particular Year*						
	74	75	76	77	78	79	80**
Initiated	1	11	15	12	11	6	2
Approved		4	9	9	15	5	1

* Calendar year

** Through July 1980

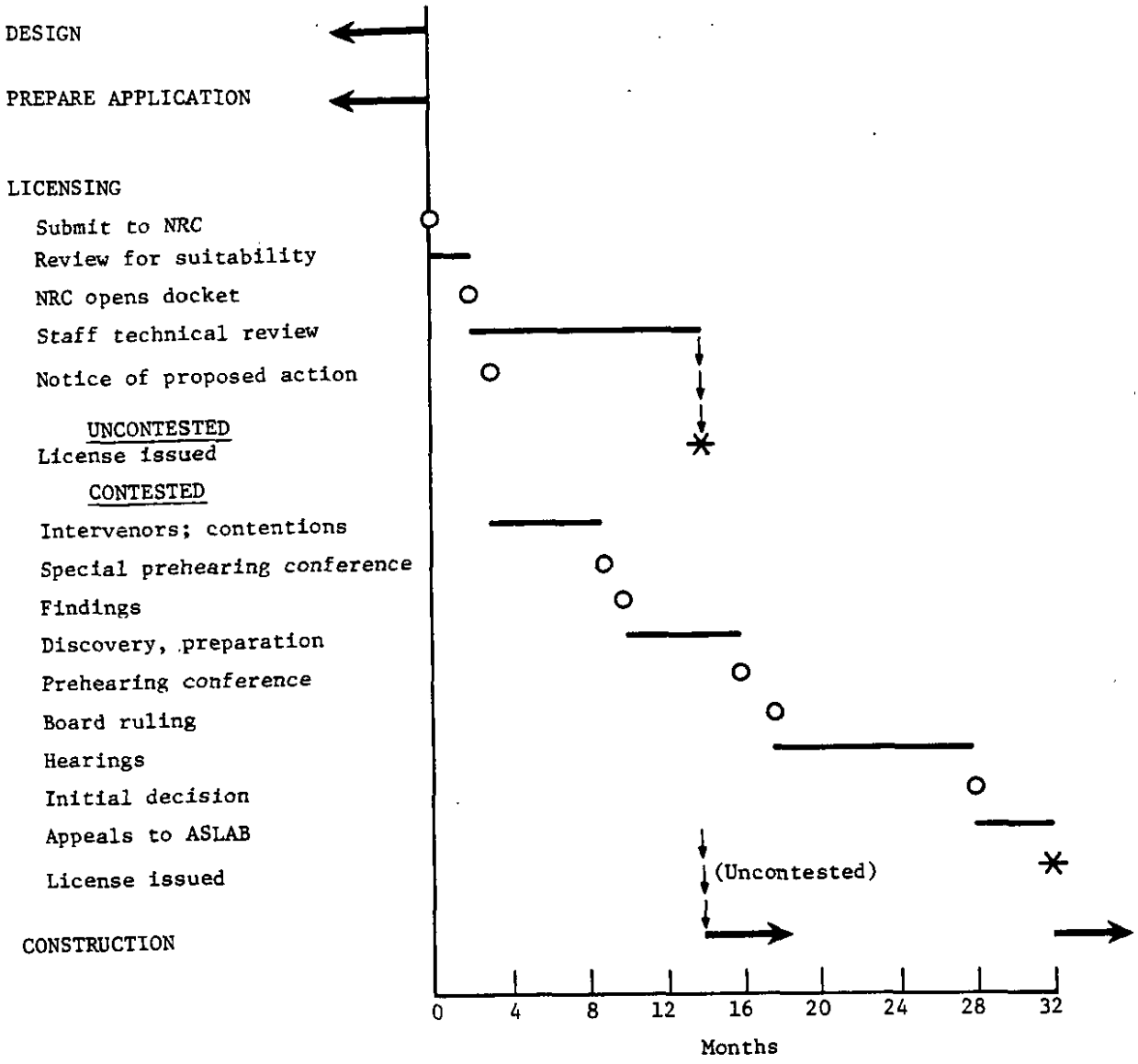

FIGURE 1. Major Elements in AFR Licensing

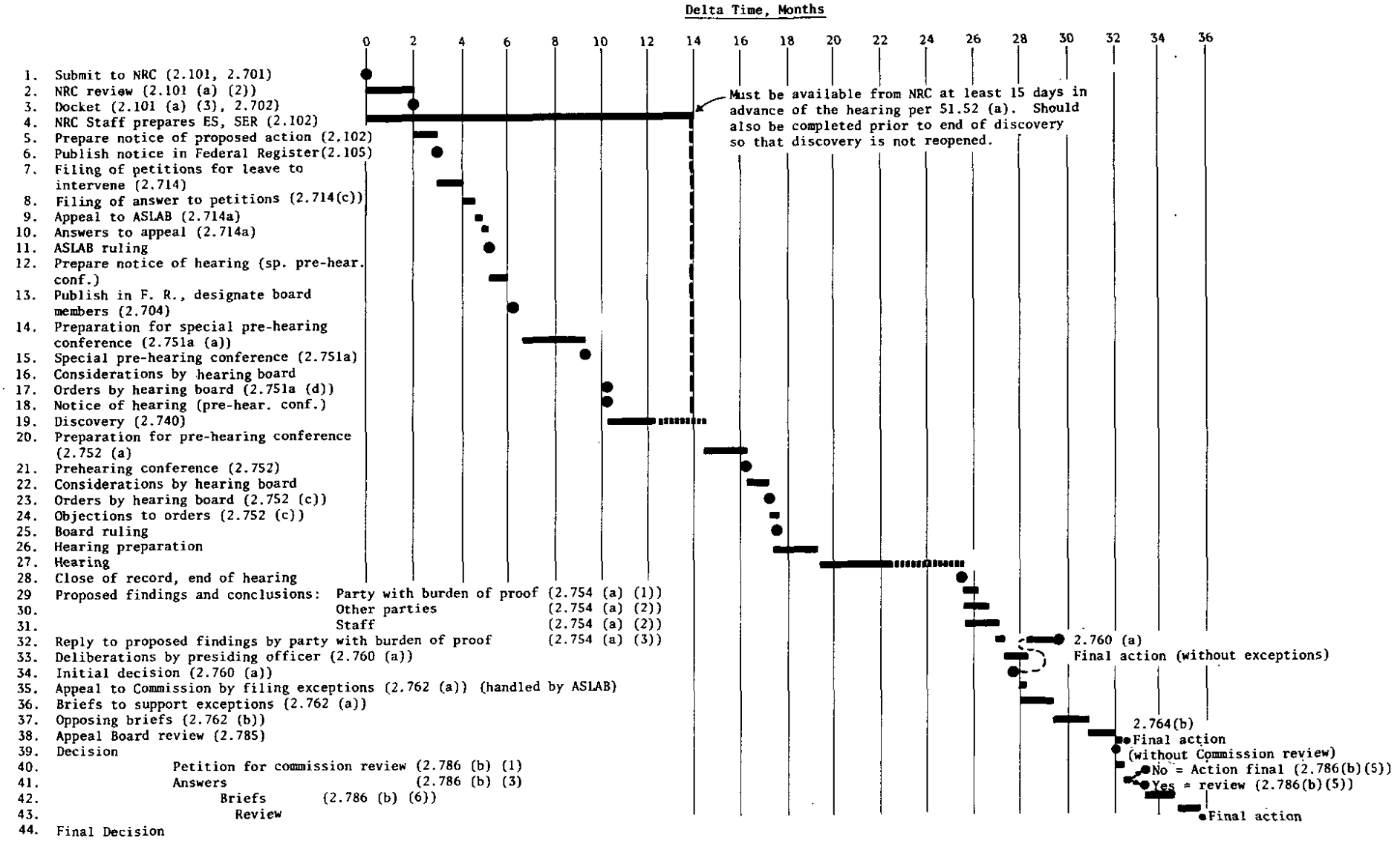

FIGURE 2. Detailed Licensing Schedule