388194

WSRC-MS-92-137 (Deleted Version)

SAVANNAH RIVER SITE 1992 ALARA GOALS (U)

by

Lee S. Smith

Westinghouse Savannah River Company
Savannah River Site
Aiken, South Carolina 29808

A paper proposed for publication at the
DOE ALARA Workshop
Upton, New York
April 21 - 22, 1992

DELETED VERSION

SAFETY • RESPONSIBILITY • SECURITY

SRS

SAVANNAH RIVER SITE

Savannah River Site
1992 ALARA Goals (U)

January 10, 1992
Health Protection Department
Westinghouse Savannah River Company
Savannah River Site
Aiken, S.C. 29808

TABLE OF CONTENTS PAGE

This document has been reviewed for Unclassified Controlled Nuclear Information (UCNI) material and has been so modified removing such material.

EXECUTIVE SUMMARY

The ALARA Goals for the Savannah River Site (SRS) for 1992 have been established by the operating Divisions/Departments and totalled for the anticipated scope of sitewide work. Goals for maximum individual exposure and personnel contamination cases have been reduced from 1991 actual data. The goal for assimilations of radionuclides remains at zero. The 633.20 rem cumulative exposure goal is constituted of special work operations and base routine operations, respectively 244.68 rem and 388.52 rem. The cumulative exposure goal is an increase of 50% over the 1991 data to support the start up of K Reactor, operations of FB Line and scheduled special work. The 633.20 rem is 4% less than the 1990 data.

Additionally, three reduction goals have been established to demonstrate a decrease in the Site overall radiological hazard. These reduction goals are for the size of airborne activity and contamination areas and the number of contamination events occurring outside a radiologically controlled area (RCA). The ALARA program is documented in the recently revised SRS ALARA Guide (October 1991).

1992 ALARA GOALS (See page 4 for detail)

- Cumulative radiation exposure (Whole Body)
- Maximum individual exposure (Whole Body)
- Personnel contamination cases
- Assimilation of radionuclides in excess of Site criteria
- Reduction in size of airborne activity areas
- Reduction in size of contamination areas (CA)
- Number of contamination events occurring outside an RCA

ASSUMPTIONS

- Estimates based on scheduled work anticipated as of December 1991 time frame to be performed in calendar year 1992
- Landlord responsibility for implementing programs to meet goals
- DOE and DOE Subcontractors not included in the WSRC total exposure
- "Other" category being assigned to appropriate responsible coordinator(s)
- Contamination event defined for facilities and equipment exclusive of personnel

1992 ALARA GOALS

Divisions/Departments	Cumulative Exposure (rem)	Maximum Individual Exposure (mrem)	Number of Personnel Contaminations Cases	Reduction		Number of Contamination Events Outside an RCA
				Size of Airborne Activity Area (SQFT)	Size of Contamination Area (SQFT)	
Construction	131.16	1,650	18	n/a	n/a	n/a
Reactor Materials	12.72	1,650	0	0	700	0
Waste Management	54.00	750	22	0	25,000	0
SRL	14.50	1,000	7	0	0	5
Tritium	1.60	100	0	0	0	0
Reactor Restart	43.56	1,650	5	0	1,200	1
Analytical Laboratory	14.17	500	4	2,000	925	0
Health Protection	55.52	1,650	6	n/a	200	0
Separations	253.69	1,650	28	6,477	9,633	0
E&PD	2.28	1,650	0	n/a	n/a	n/a
Other*	25.00	1,650	3	n/a	n/a	4
WSRC Goal	608.20	1,650 maximum	93	8,477	37,658	10
DOE &DOE Subcontractors**	25.00	n/a	7	n/a	n/a	n/a
SRS Goal	**633.20**	**1,650 maximum**	**100**	**8,477**	**37,658**	**10**

*DIVERSCO, C&R, Aiken Technical College, TEMPS, Industrial Phases, NORMANDEAU, SUB-RPM, Digital Equipment Company, United, Bechtel-National, Wilmington, Unassigned, SRS Fire Department and Site Services consisting of Central Services Works Engineering, Power Operations, Power Technology, Facilities and Services, Operations Integration, Digital and Control Systems

**Department of Energy, SR Ecology Laboratory, US Forestry Service, Southern Bell, Wackenhut Security, AT&T, NUS, SCDHEC, OPM, SAIC, Stone & Webster, U.S. Corps of Engineers and Xerox

0 -- Indicates work areas optimized or no reductions planned

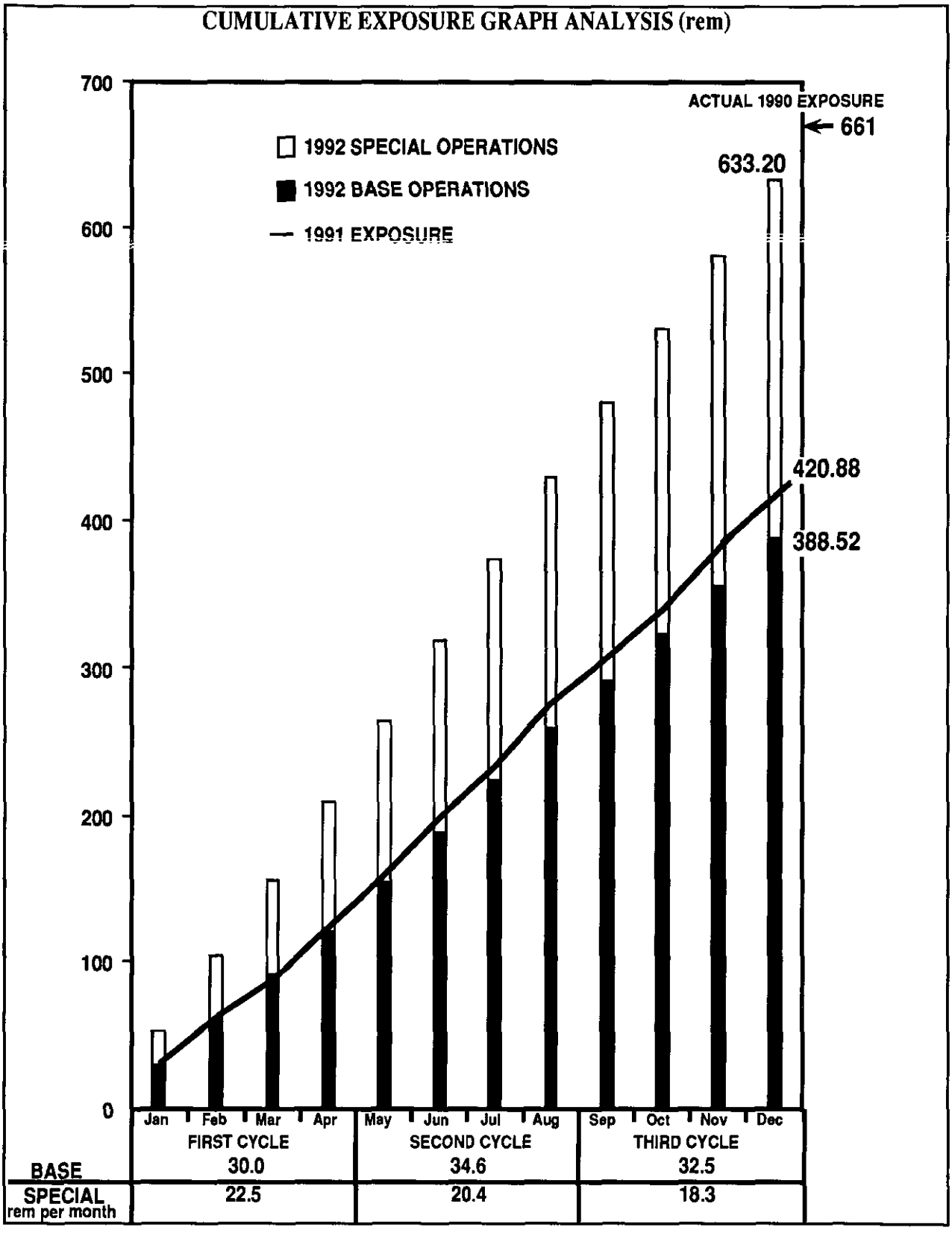
n/a -- Not applicable

1992 CUMULATIVE EXPOSURE DETAIL (rem)

DIVISIONS/DEPARTMENTS	TOTAL	B-BASE S-SPECIAL	JANUARY FEBRUARY MARCH APRIL	MAY JUNE JULY AUGUST	SEPTEMBER OCTOBER NOVEMBER DECEMBER
Construction	131.16	B 55.99	19.37	22.71	13.91
		S 75.17	19.11	28.31	27.75
Reactor Materials	12.72	B 9.44	3.12	3.20	3.12
		S 3.28	0	2.26	1.02
Waste Management	54.00	B 30.48	9.76	10.28	10.44
		S 23.52	9.28	7.24	7.00
SRL	14.50	B 10.92	3.80	3.80	3.32
		S 3.58	1.01	1.51	1.06
Tritium	1.60	B 1.60	0.53	0.54	0.53
		S 0	0	0	0
Reactor Restart	43.56	B 40.14	13.38	13.38	13.38
		S 3.42	0.55	0	2.87
Analytical Laboratory	14.17	B 7.16	2.38	2.38	2.40
		S 7.01	2.33	2.33	2.35
Health Protection	55.52	B 22.26	7.42	7.42	7.42
		S 33.26	9.57	11.52	12.17
Separations	253.69	B 158.25	43.12	57.25	57.88
		S 95.44	48.25	28.24	18.95
E&PD	2.28	B 2.28	0.64	0.64	1.00
		S 0	0	0	0
Others*	25.00	B 25.0	8.33	8.33	8.34
		S 0	0	0	0
WSRC	608.20	B 363.52	111.85	129.93	121.74
		S 244.68	90.10	81.41	73.17
DOE & DOE Subcontractors**	25.00	B 25.0	8.33	8.33	8.34
		S 0	0	0	0
SRS Goal	633.20	B 388.52	120.18	138.26	130.08
		S 244.68	90.10	81.41	73.17

*DIVERSCO, C&R, Aiken Technical College, TEMPS, Industrial Phases, NORMANDEAU, SUB-RPM, Digital Equipment Company, United, Bechtel-National, Wilmington, Unassigned, SRS Fire Department and Site Services consisting of Central Services Works Engineering, Power Operations, Power Technology, Facilities and Services, Operations Integration, Digital and Control Systems

**Department of Energy, SR Ecology Laboratory, US Forestry Service, Southern Bell, Wackenhut Security, AT&T, NUS, SCDHEC, OPM, SAIC, Stone & Webster, U.S. Corps of Engineers and Xerox


CUMULATIVE EXPOSURE GRAPH ANALYSIS (rem)
700
600
500
400
300
200
100
0
ACTUAL 1990 EXPOSURE
661
1992 SPECIAL OPERATIONS
1992 BASE OPERATIONS
1991 EXPOSURE
633.20
420.88
388.52
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
FIRST CYCLE
SECOND CYCLE
THIRD CYCLE
BASE
30.0
34.6
32.5
SPECIAL
rem per month
22.5
20.4
18.3

CUMULATIVE EXPOSURE COMPARISON (rem)

Divisions/Departments	1992 Goal	1991 Initial Adopted***	1991 Actual
Construction	131.16	267.89	116.93
Reactor Materials	12.72	34.20	14.195
Waste Management	54.00	94.80	33.695
SRL	14.50	20.00	7.775
Tritium	1.60	1.60	1.78
Reactor Restart	43.56	40.71	26.33
Analytical Laboratory	14.17	13.48	5.93
Health Protection	55.52	68.78	47.91
Separations	253.69	151.80	101.92
E&PD	2.28		2.65
Other*	25.00	86.74	33.075
WSRC Goal	608.20	780.00	392.19
DOE & DOE Subcontractor**	25.00	n/a	28.69
SRS Goal	633.20	780.00	420.88

*DIVERSCO, C&R, Aiken Technical College, TEMPS, Industrial Phases, NORMANDEAU, SUB-RPM, Digital Equipment Company, United, Bechtel-National, Wilmington, Unassigned, SRS Fire Department and Site Services consisting of Central Services Works Engineering, Power Operations, Power Technology, Facilities and Services, Operations Integration, Digital and Control Systems

**Department of Energy, SR Ecology Laboratory, US Forestry Service, Southern Bell, Wackenhut Security, AT&T, NUS, SCDHEC, OPM, SAIC, Stone & Webster, U.S. Corps of Engineers and Xerox

***1991 Goal Evolution
780 Adopted through policy review (January 1991)
593 First Review Goal (May 1991)
447 Second Review Goal (October 1991)

n/a -- Not applicable

PERSONNEL CONTAMINATION CASES COMPARISON			
Divisions/Departments	1992 Goal	1991 Goal	1991 Actual
Construction	18	35	8
Reactor Materials	0	0	0
Waste Management	22	20	15
SRL	7	7	7
Tritium	0	0	1
Reactor Restart	5	9	11
Analytical Laboratory	4	8	3
Health Protection	6	3	6
Separations	28	26	28
E&PD	0	0	0
Other*	3	3	3
WSRC Goal	93	111	82
Doe & DOE Subcontractors**	7	n/a	1
SRS Goal	100	111	83

*DIVERSCO, C&R, Aiken Technical College, TEMPS, Industrial Phases, NORMANDEAU, SUB-RPM, Digital Equipment Company, United, Bechtel-National, Wilmington, Unassigned, SRS Fire Department and Site Services consisting of Central Services Works Engineering, Power Operations, Power Technology, Facilities and Services, Operations Integration, Digital and Control Systems

**Department of Energy, SR Ecology Laboratory, US Forestry Service, Southern Bell, Wackenhut Security, AT&T, NUS, SCDHEC, OPM, SAIC, Stone & Webster, U.S. Corps of Engineers and Xerox

n/a -- Not applicable

DIVISION GOALS

Construction

The ALARA goal for Construction for 1992 is estimated at 131.16 rem. This number is an 11% increase over the 1991 actual yearend exposure of 116.93 rem. Base routine operations account for 55.99 rem, and special work operations account for 75.17 rem, or 43% and 57% of the 131.16 rem total. The base operations work will be 19.41 rem from January to April, 22.62 rem from May to August and 13.96 rem from September to December. The special operations will be 19.14 rem from January to April, 28.25 rem from May to August and 27.78 rem from September to December.

The number of personnel contamination cases is estimated at 18 cases for 1992 . This number is a 44% decrease over the 1990 actual number of 32 cases. Of significance, the 1991 data was not used as a comparison base. The exemplary performance of the work force in 1991 has resulted in a yearend number of personnel contaminations at 8 cases.

Construction supplies personnel and equipment to perform onsite work and, as such, maintains no facility where reduction goals are applicable.

Reactor Materials

The Reactor Materials Area's 1992 exposure goal is 12.72 rem. The goal is 90% of the actual exposure in 1991 received by M-Area personnel, 14.195 rem.

The base line, 0.98 rem per month, was calculated from the averages of the nonfuel producing months June through September. Added to this baseline was the expected dose of 0.52 rem per month for six months while completing the M-93 and K-16 charges. The 0.52 rem was the difference between the average for nonfuel producing months and the average for the fuel producing months, January through May.

Exposure reductions are expected to continue in 1992 due to the increased awareness of ALARA practices. The billet handling project that will be completed during 1992 will greatly reduce the handling of radioactive materials by personnel in Building 321-M. The use of Radiation Work Permits (RWPs) and Standing Radiation Work Permits (SRWPs) will also increase awareness of radiation exposure.

Reduction goals for Reactor Materials are applicable to the size of contamination areas where 700 square feet will be reclaimed in 1992. The existing airborne activity area of 2,440 square feet will not be reduced.

Waste Management

The Waste Management radiation exposure goal for 1991 was 49.81 rem. The actual exposure for 1991 was 33.695 rems. The goal for 1992 is 54.0 rems. The reasons for the expected increase are as follows:

- The 1H evaporator was scheduled to start up after the first of the year. Normal operations of the evaporator, including reading and maintenance, will increase the exposure of H-Tank Farm personnel over last year. Also included in the H-Tank Farm exposure is the 299-H Decontamination Facility. This facility has been shut down for about one year. This facility was expected to be in operation before the end of 1991. This facility will also increase the radiation exposure for H-Tank Farm.

- The In-Tank Precipitation (ITP) Facility will continue startup activities. These startup activities will become more involved than last year and will also result in more radiation exposure for personnel.

- F-Tank Farms plans to begin maintenance and construction activities that were scheduled last year and were not started. This will increase the exposure slightly for personnel.

Successive iterations of this 1992 goal went from 86 rem to 70+ rem to the current 54 rem. Anticipated ALARA initiatives to be implemented include the formation of a Waste Management ALARA Committee.

The other WM goals for ALARA are as follows:

- Reduction of RCAs with transferable contamination by 25,000 square feet.

- Maximum individual exposure not to exceed 750 mrem for the year.

- Contamination cases not to exceed 22 for the year.

- No contamination cases outside of an RCA.

- No assimilations.

Savannah River Laboratory

The Savannah River Laboratory (SRL) ALARA Goal for 1992 is 14.5 rem. This number is an increase of 86% over the actual yearend exposure for 1991 of 7.775 rem. One fourth of this exposure estimate is to support special work operations over the year. The special operations include MSF restart, F-080 decontamination, HAW pipe gallery decontamination and SED.

ALARA actions to reduce exposures include the using of RWP(s)/SRWP(s), removing waste from CPF TP lower background MSF, planning and using robotics to perform decontamination and entry control.

The reduction goal applicable to SRL is the number of contamination events outside an RCA to five cases.

Tritium

The ALARA goals for tritium operations for 1992 continue to be a very small part of the Site total. The cumulative exposure is estimated at 1.6 rem with a maximum individual exposure of 100 mrem. The number of personnel contamination cases and events outside an RCA is estimated at 0 cases/events. Established boundaries of RCAs preclude other reductions in size.

Radiation protection initiatives include radiation protection training, initiatives to reduce the number of contamination cases and initiatives to reduce the extent and magnitude of contamination areas.

All personnel presently assigned in the Tritium Facility have attended the Core Radiation Worker Training (RWT). All facility personnel were scheduled to have completed Facility Specific RWT by the end of 1991. The Tritium Facility will continue to support the effort to train/retrain employees in the RWT program as additional classes are offered.

Tritium Facility personnel are trained in the use of protective clothing and proper work practices required to prevent personal contamination. Any personnel contamination cases that do occur will be investigated to determine the cause of the incident. Followup action will take place to correct not only the specific deficiency of a particular case but also any underlying weakness that may be identified.

Certain work areas within the Tritium Facility RCAs are designated as Contamination Areas (CAs). The floor space within the CAs has some transferable contamination present as a consequence of routine production operations. Contamination levels are kept ALARA and are monitored routinely by the Health Protection Department (HP). Contamination levels found above facility limits are immediately cleaned to ALARA levels by facility personnel.

Reactor Restart Operations

The ALARA goals for 1992 for Reactor Restart Operations are based on the following assumptions:

- Except for L Reactor defueling, there will be no major jobs contributing to exposure outside K Reactor.
- Defueling L Reactor will contribute the same exposure as defueling P Reactor.
- L Reactor defueling will occur in the first quarter of 1992.
- No major jobs contributing to exposure will occur during operations.
- K Reactor outage will occur in the fourth quarter of 1992.
- Only four major jobs contributing to exposure during first K Reactor outage.
- Major jobs will be preplanned to maximize effectiveness of mockups and walkthroughs.
- Overall exposure for work groups will be "levelized" so that no worker will exceed average exposure for individual workers in that work group from the previous year.
- Average number of workers in work groups will continue to be reduced during 1992.

The total square footage of RCAs from K Reactor, L Reactor and P Reactor is 395,850 square feet. A reduction of 1,200 square feet will be reclaimed in 1992.

Currently, there exist no airborne activity area for applicable reductions exists.

The cumulative radiation exposure estimate is made on base routine operations and special work operations. Exposure indices document the estimate of the exposure necessary to perform base and special operations. These exposure indices have been periodically updated to reflect current good industry practices in health protection. Additionally, 10% of the estimate has been subtracted to take credit for ALARA initiatives to be implemented during the year of operation.

Exposure Estimate

Base Routine Operations		45.622
K-Reactor Safety Rod Placement		0.600
A005 - Tech Baseline System Walkdowns		Base
A041 - K-Reactor Cooling Tower Tie-In		Base
A043 - 105 Building Flood Control Sump Pumps		Base
A044 - GM Diesel Generator Load Reduction and Sequencing		Base
A046 - Replace Safety and Control Computer		Base
A048 - Replace Reactor Charge/Discharge Computer		Base
A049 - Reactor Isotopic Release Monitoring		Base
A050 - Replace GM Power and Starting Cables		Base
A070 - Upgrade I&C Power Supplies		Base
A075 - Replace 6 Manual Septifoil Valves		0.300
A077 - Upgrade Incident Control Circuitry		N/F
A081 - Reactor Electrical Distribution Upgrades		Base
A148 - Improved Reactor Confinement System		Base
A178 - Improved Fire Protection - Reactor Building		Base
A179 - Long Range Seismic Qualification Program		Base
B132 - Replace Check Valves in CWS Recirculating Building		N/N
N278 - Replace Sump Pumps		N/F
N281 - Upgrade Air Compressor Control Circuits		Base
N320 - Reactor Seismic Improvement Program		Base
Inspect #3 Bingham Pump		1.200
Defuel L-Reactor		0.681
	Total	48.403 rem
	at 90 percent	43.563 rem

Analytical Laboratory

Analytical Laboratory estimates of 1992 ALARA goals are based on three factors. The factors are projected workload increases as received from production, planned projects and projected 1991 exposures to personnel in each work group. The projected work load increases include startup of the FB-Line facility; a 25% increase of F&H Canyon operations; a 50% increase in the utilization of tanks by production around the ITP Laboratory as calculated form HPM-88207; a 50% increase in the sampling of waste tanks; and HB-Line projecting a twofold increase in work. The planned projects for 1992 include preventative maintenance, shielded area A and decontamination of area C, 772-F cell decontamination, 772-1F drain replacement and engineer investigations for job pre-planning.

Appropriate detail follows. Staffing is expected to increase/decrease as necessary to support work.

Facility	1992 Estimates Initial	1992 Estimates Final	1991 Estimates Initial
320 M Laboratory	.10	.10	.25
772D/WQL	.18	.18	.05
A&PA/CA*	1.00	.85	
A&PA/IA*	1.00	.85	
A&PA/HB-Line	.80	.68	
AL/CLFE Project Support*	5.40	4.59	5.54
AL/CLFE Building Services	.08	0.08	
AL/CLFE Building Equipment*	.80	.68	
AL/CLFE Engineering and Spec	.28	.28	
ETF Laboratory	.05	.05	.65
ITP Laboratory*	.90	.76	
Labs/SPC*	2.98	2.53	
Process Instrumentation*	2.00	1.70	2.00
Technical Oversight	.05	.05	.02
Technical Services Group*	.67	.57	
Tritium Facility Laboratory	.12	.12	.10
Waste Analysis Group	.10	.10	.10
Total	16.51	14.17	13.48

*ALARA practices implemented should reduce initial estimates to final estimates by 15%, for an overall reduction in Analytical Laboratory by 14%.

1991 Initial total for F-Area not shown is 4.07 compared to 5.70 for 1992 for same group.

Reduction goals for Analytical Laboratories are applicable for both size of airborne activity areas and contamination areas at 2,000 square feet and 925 square feet, respectively.

Health Protection

The 1992 ALARA goal that has been established by the Health Protection (HP) Department reflects historic data of past operational years, year-end 1991 exposures and the projected work scheduled to be performed in which HP coverage is essential.

The 1992 radiation exposure goal for HP was established at 68.68 rem. This goal was aggressively reduced to 55.52 rem. Base routine operations account for 40 percent, and the special work operations account for 60% of 55.52 rem. The goal is 68% of the total exposure that is reasonably expected, 81.74 rem.

Work Group	1992 Goal (rem)
100 Areas	9.00
F- Area	20.00
H/S/Z Area	21.12
3/700 Area	1.00
Central Shops	0.10
D-Area	0.10
SRL	2.20
HPT	1.20
HP PASS	0.05
HP Training	0.75
TOTAL	55.52

The 1991 actual exposure of 45.47 rem for Health Protection Operations and 2.44 rem for Health Protection Services was used as a baseline. The major contributors for the additional expected radiation exposure are due to the following: H-Area Tank Farm support, Old HB-Line D&R, new HB-Line startup, FB-Line startup and FB-Line upgrades and D&R.

ALARA initiatives to reduce radiation exposure include the following: complete institution of RWP(s)/SRWP(s) for all work, increased awareness of exposures on a daily and monthly basis and mockup training prior to actual work.

The goal for personnel contamination cases is 6 cases. The total for 1991 was 6 personnel contamination cases.

A reduction goal of 200 square feet has been established for the size of contamination areas. No airborne activities areas exist for reduction. Reduction goals are facility specific. Health Protection personnel fully support initiatives to reduce all radiological hazards, including reduction of the size of contamination and airborne activity areas in all facilities.

Separations

With 1991 being a Separations Area nonproduction year, the actual yearend exposure is 101.92 rem, with a 1992 estimated goal of cumulative exposure of 253.69 rem. The significant increase in exposure is supported by historical data from production years of 1987-1989. Similar operations to take place in 1992 include the following:

- FB-Line Facility (131 rem), which represents approximately 52% of the goal, is on-line to start up in February.
- H-Canyon (25.5 rem) exposure goals are operations and planned activities, i.e., removal of fire eye 10H, jumper removal hot canyon, decon/repair of canyon equipment and building upgrades.
- HB-Line (19.50 rem) exposure is based on data form 1987, which was the last year the facility was in production. Plan production is projected to remain constant throughout the year.
- Old HB Line (29.50 rem) will resume D&D Operation with an increase in personnel to cover special work.
- 235 and 247-F (10.44 rem) will resume vault operation in 1992.
- Separations Engineering (18.10 rem) exposure relates to forecast production, changes in business and special jobs.
- Other groups and facilities will operate similar to 1991 and provide support to the facilities that are resuming and/or starting new operation in the area of appraisals, audit and surveillances.

It is estimated that ALARA initiatives will save approximately 10-30 rem. The estimated goal of 253.69 rem reflects this saving. Initiatives include the following:

- RWPs and SRWPs throughout the PMT.
- Identification of hot spots and low dose areas.
- Remote operation in 247-F Vault.
- Shielding and remote tooling in FB Line and H Canyon.
- Relocation of field desks to lower exposure area.
- Use of mockups, preplanning and experienced workers.
- Implementation of ALARA plans, procedure and checklist
- ALARA awareness and job evaluations.
- Portable shields and alarming dosimeters.

- Radiation Worker Training.
- Use of glove port covers.
- Implementation of recommendations by task teams, facility action teams and ALARA Committee.

In 1990, the goal to experience no more than 36 personnel contamination cases was met. The 1991 goal was reduced to 26 contamination cases and the actual year end total is 28 cases. An aggressive goal (considering the amount of work scheduled) of 28 cases was set for 1992.

Separations has identified 6,477 square feet of airborne activity area to be recovered in 1992.

Contamination areas totaling 9,633 square feet have been identified for recovery in 1992.

The contamination events occurring outside a RCA is zero.

Engineering and Project Division (E&PD)

E&PD is comprised of Projects Management, Systems Engineering, Design Engineering and Construction Management. The Construction Management Department comprises the largest segment of radiation workers within the division. The 1992 exposure goal for E&PD is 2.28 rem. This goal is based on actual 1991 exposures with a slight variation in Projects Management because of the anticipated increase in personnel within the department. No contamination cases occurred within these three departments in 1991, and for 1992 the goal will be zero contamination cases.

The work scope of this division will be essentially the same in 1992 as in 1991. Greater exposures and potential for personnel contamination may be realized when K Reactor operates and planned fourth quarter outage occurs. Personnel exposures within this division occur during normal base operations that require access to RCAs and CAs to scope design activities. All personnel are required to receive General Employee Training (GET), and some personnel also receive Radiation Worker Training (RWT). With this training, personnel are made aware of the potential hazards associated with working in RCAs and CAs and are taught the ALARA principles of time, distance, shielding and adherence to area postings.

E&PD maintains no facilities where reduction goals are appropriate.

Other

An "other" category was historically used to collect data not otherwise assigned to a division/department. In 1991, the other category contained the following:

DIVERSCO, C&R, Aiken Technical College,TEMPS, Industrial Phases, NORMANDEAU, SUB-RPM, Digital Equipment Company, United, Bechtel-National, Wilmington, Unassigned, SRS Fire Department and Site Services consisting of Central Services Works Engineering, Power Operations, Power Technology, Facilities and Services, Operations Integration, Digital and Control Systems.

Efforts are currently underway to limit the "other" category in 1992. The other category will be comprised of only those operations that can not be logically allocated to a division/department.

The actual cumulative exposure for 1991 assigned to the other category was 33.075 rem. For 1992, the ALARA goal is 25.0 rem. The year-end 1991 number of personnel contaminations assigned to the other category was 3 cases. For 1992, the ALARA goal remains established at 3 cases.

Site Services has broken away from E&PD. Site Services is made up of Central Services Work Engineering, Power Operations, Power Technology, Facilities and Services, Operations Integration and Digital and Control Systems. As an estimate of the 1992 goal, Site Services would be 5.58 rem of the ALARA goal.

The Environmental Restoration Department, Saltstone (Z-Area) and Defense Waste Processing Facility are totalled in the other category as a part of the 25.0 rem goal.

Department of Energy (DOE) and DOE Subcontractors

In 1991, the DOE and DOE Subcontractors were made up of DOE, Savannah River Ecology Laboratory, U.S. Forestry Service, Southern Bell, Wakenhut Security, AT&T, NUS, SCDHEC, OPM, SAIC, Stone and Webster, US Corps of Engineers and Xerox.

Wackenhut Security accounted for the largest single contribution to cumulative exposure in 1991. Cumulative exposure for 1991 was 25.595 rem. The number of personnel contaminations for Wackenhut personnel is one case.

ALARA Goals for 1992 for DOE and DOE subcontractors have not been established, though Wackenhut Security is in the process. A 25 rem exposure has been taken as an ALARA goal for 1992. The number of personnel contaminations has been taken at 7 cases. This number is the best estimate available for accounting purposes at this time. It is expected that part of these cases will be reallocated as enhancements to performance indicator tracking are made during the year.

ASSIMILATIONS

- 1992 Goal established at 0.
- An assimilation is defined as 100 mrem committed effective dose equivalent in the 12 month period following the uptake.

REVIEW OF ESTABLISHED GOALS

- Compare 1992 goal estimates with actual performance.
- Detailed review and goal adjustment at four month cycles.
- Cumulative exposure, estimates within $\pm$ 10% of actuals.
    - Evaluate performance against individual department base operations goals and adjust origin and slope of baseline.
    - Evaluate performance against individual department special operations goals and adjust appropriately.

1.0 PURPOSE

The establishment of goals and their periodic review and comparison with actual data are methods for tracking the progress towards the ultimate purpose of the ALARA program - reducing exposures to as low as reasonably achievable. Goals at the SRS are established at the division/department/facility level. Goal review ensures that ALARA is considered in all facets of work at the Site.

Recommendations found in INPO 88-10[1] state that radiological protection goals should be understood as motivators for improvement. The purpose of a goal is not simply to meet a numerical value and a written word, but also the spirit and intent to improve radiological protection programs and ALARA performance. Goals should be achievable. Goals should be rigorous and based on a standard of excellence to be as low as reasonably achievable.

2.0 BASIS FOR GOALS

The development of goals for an upcoming year requires facilities to review historic work and exposure records, anticipated production schedules, and maintenance schedules. Exposure estimates per task should be accurate. The radiation work permit program and associated pre-job and post-job ALARA reviews provide a good base of historical information for typical jobs. The key to accurately predicting ALARA goals rests with the ability to identify the type and the amount of work that will actually be performed during the year. Once the information is developed and the numbers are quantified, the amount of savings through implementation of ALARA principles will be subtracted. The goal for actual exposures should be 20 to 30 percent less than estimates[2].

The site currently tracks collective whole body radiation exposure, maximum individual whole body dose, contamination cases, and assimilations. The following paragraphs provide guidance for setting of ALARA goals for radiation exposures, contamination cases, maximum individual exposures and assimilations.

2.1 Establishment of Radiation Exposure Goals

The initial development of the radiation exposure goal is the responsibility of the facility and work group managers. Goals based on the anticipated work for the upcoming calendar year within the facility and the projected participation of any individual work group(s) will be estimated. The ALARA coordinator for the specific division/department will coordinate the total exposure goal.

The following steps are recommended to be taken to provide the required information for the upcoming calendar year:

- Categorize the activities as either: Base Routine Operations or Special Work Operations.
- Estimate the time frame of the work activity by months.
- Estimate the total exposure for each activity.
- Estimate the percent of work completed by four month periods of January-April, May-August, September-December.

- Determine all work groups involved for each activity.
- Estimate the percentage of exposure that will be received by each work group involved in each activity.
- Estimate the total exposure received by the facility or work group.

After the facility has developed its activity plan and estimate of total exposure, each work group involved (e.g., maintenance, health protection) will be able to establish ALARA goals. Work groups that have responsibilities in one or more facilities must coordinate their goal based on these activity plans. Each work group must participate in the initial facility goal setting process for accuracy of the original numbers.

The ALARA Steering Committee representatives must take a proactive role in assuring the activity plans provide the information that is needed for all divisions/departments to develop accurate goals.

2.2 Establishment of Contamination Goals

The establishment of contamination goals will be a combination of historic performance and the activities that will take place in each facility. The projected activity plans should be used by the facility and work group to estimate the number of contamination cases. The type of activities scheduled to take place (e.g., decontamination and decommissioning) will give indications for the possibility for contamination cases. The contamination case goals should address the following:

- Incidents of personnel contamination
- Incidents of contamination outside posted RCAs
- Total floor area square footage of RCAs
- Total floor area square footage
- Total square footage of floor areas within RCAs requiring respiratory protection (posted as Airborne Radioactivity Areas) and contamination controls

The ALARA Steering Committee representatives need to take a proactive role in assuring the activity plans provide the information that is needed for all divisions/departments to develop accurate goals.

2.3 Establishment of Maximum Individual Exposure and Assimilation Goals

The ALARA Steering Committee supports goals for the number of the maximum individual radiation exposure and assimilations of radionuclides. The maximum individual exposure is given in WSRC 5Q Manual, Radiological Control, Sections 3 and 6[3]. The administrative individual exposure for 1991 is established at 1700 mrem. The goal is to have zero cases departing from guides unless justified/approved through management. The goal of assimilations is to limit all intakes of radionuclides, especially those that result in a committed dose of 100 mrem or greater over a one year period, to zero.

3.0 GOAL DEVELOPMENT ORGANIZATION

Each division/department has representation on the ALARA Steering Committee. This individual is responsible for coordinating the ALARA goals for the division/departments (Attachment 7-1). The ASC is responsible for developing SRS goals. The ASC presents the recommendations to the Radiological Quality Improvement Review Committee, which is responsible for reviewing and approving the goals developed by the ASC. Final approval of Site goals is the responsibility of the WSRC Policy Review Committee. Goal Setting Flow Diagram and 1992 Goal Development Schedule are given as Attachments 7-2 and 7-3. The goals are generally submitted to the Policy Review Committee for approval during the December policy review meeting.

4.0 DOCUMENTATION OF GOAL PERFORMANCE

The trending of radiation exposures is a method of quantifying the success of the ALARA program. This trending applies both at the Site level and the facility level. Performance indicators will be developed to verify ALARA initiatives during 1992.

Since 1983, the Health Protection Department has issued an annual Radiation Exposure Report. The report contains the previous year's goals and the actual exposure values broken down by area. Trending of past years' exposure is included for comparison purposes. Also included in the report are major dose contributing jobs, ALARA initiatives implemented during the course of that year, and the following year's goals.

4.1 Required Documentation

Facilities and work groups will document their respective activity plans using the Radiation Exposure Worksheet shown in Attachment 7-4. Once complete, the worksheets will be forwarded to the ASC representative. The contamination case goals are to be provided to the ASC representative as an official memorandum.

This documentation will be reviewed by the ASC as described in Part 3.0 and retained by the ASC Chair as a record of the original goal establishment. The document will be used to track the actual exposure to assist in the review of the goals performance .

4.2 Example of Radiation Exposure Worksheet

Attachment 7-5 is an example of a completed Radiation Exposure Worksheet.

- Part I, A lists the and base routine operations estimated total exposure. The next column is the percent of exposure received and is evenly distributed throughout the year. The work groups involved for the activity are listed in the next column with the estimated percent of exposure. The last column is the exposure total for the facility.

  Note: The Health Protection contribution of 4 rem has been subtracted out of the total 40 rem.

- Part I, B lists the special projects planned for the facility during the year. Similar information is provided as that in Part I, A. The percent of exposure received is estimated for each third of the year.

- The estimated total exposure and the final yearly exposure for all work associated with the facility is determined.

- Part II, lists specific ALARA actions implemented for an activity to reduce radiation exposure.

Attachment 7-6 is an example of a Radiation Exposure Worksheet that is completed by a work group based on the information provided on the facility worksheet (Attachment 7-5).

- Part I, B, the special jobs that the work group is involved in are listed. The exposure the facility estimated is provided, giving the work group a total exposure value.

5.0 REVIEW OF GOALS

During the year, there will be periodic reviews of radiation exposure goals, typically after the fourth badge cycle (April) and after the eighth badge cycle (August). Radiation exposure goals will be compared to the actual prorated exposure performance. The job schedule for the rest of the year will also be reviewed at these times. Radiation exposure goals are permitted to be increased/decreased as required provided there is proper supporting documentation. This adjustment provision is designed to accommodate jobs that started and were not completed, delayed jobs, and operations which were not anticipated when the original goal was established.

The contamination case, maximum individual exposure and assimilation goals are generally not revised during these review periods.

When the facilities and work groups have completed the review of the radiation exposure goals, any revisions will be recommended and approved using the method described in Part 3.0.

6.0 REFERENCES

[1]Institute of Nuclear Power Operations, "Guidelines for Radiological Protection at Nuclear Power Stations," INPO 88-10, May 1988.
[2]Ibid
[3]WSRC, 5Q, "Radiological Controls".

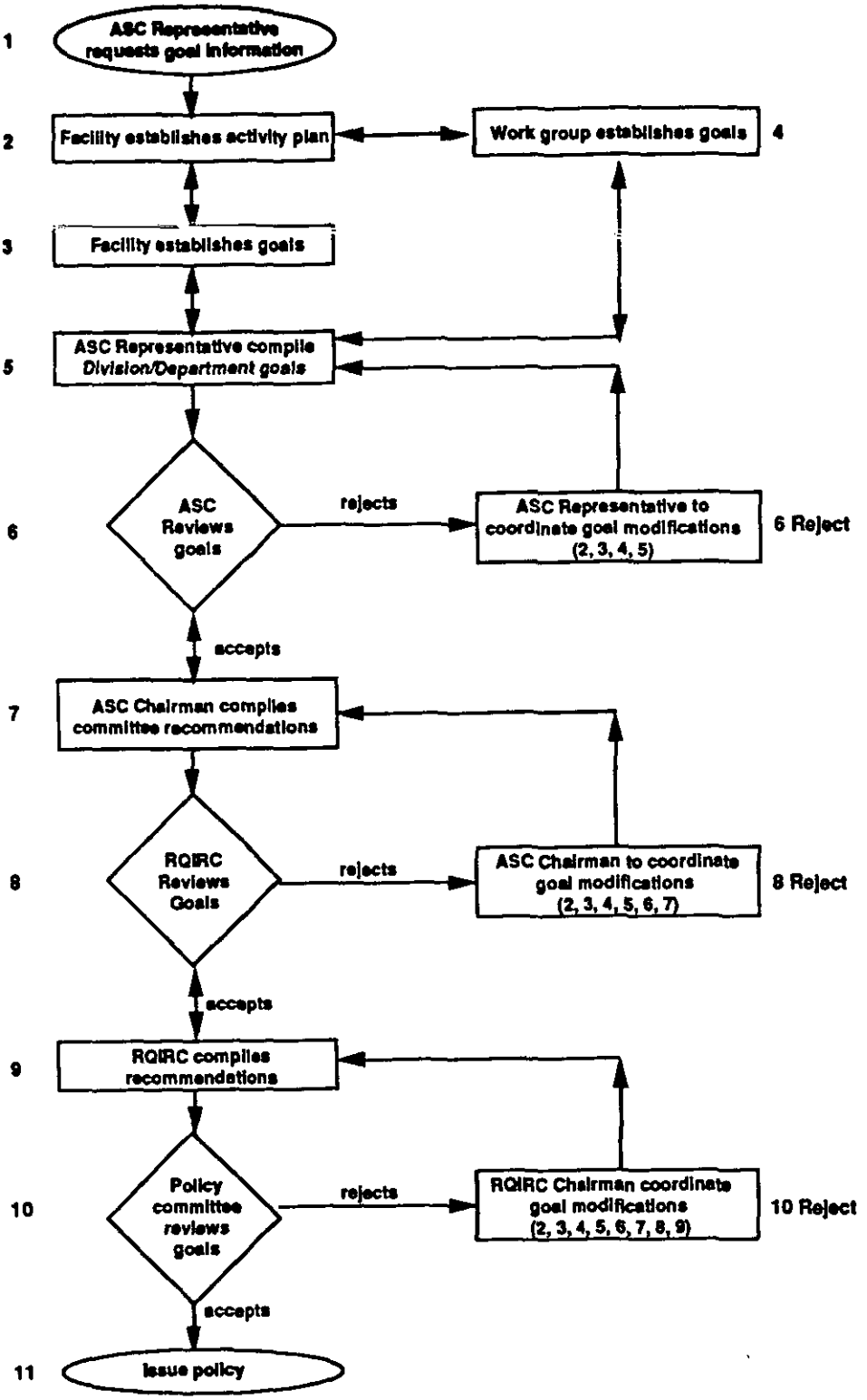
Attachment 7-1 Goal Setting Responsibilities

Analytical Laboratories	Construction	Engineering & Project Design	Health Protection	Reactor Materials
F Area H Area M Area D Area	Reactor Areas F Area H Area M Area D Area G Area S/Z Areas A Area	For all Areas: Projects System Engineering DC&S CSWE Power Facility & Services	Reactor Areas F Area H Area M Area S Area G Area Central Shops SRL	Production Quality Engineering & Technology

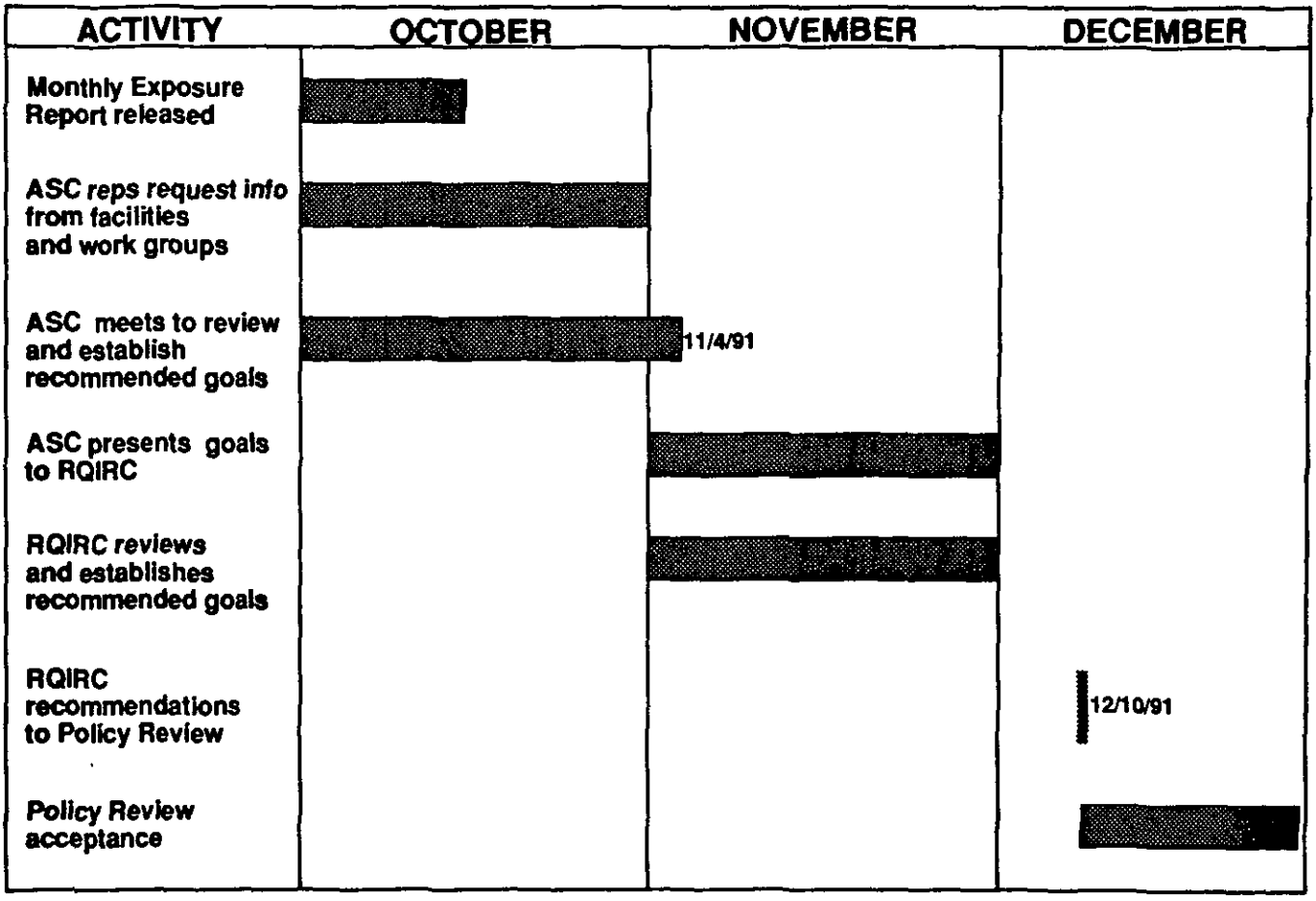
Reactor Restart	SRL	Seperations	Tritium	Waste Management
For K, L, P & L: Operations Training & Procedures Engineering Outage & Maintenance Startup & Testing Program Assessment For D Area: Heavy Water	1 Goal	F Area includes: Production: Canyon Outside Facilities 235-F 247-F FB-Line Engineering Technology Projects Quality H Area includes: Production: Canyon HB-Line RBOF Engineering Technology Projects Quality	RTF Operations Technology & Engineering	F Area includes: Operations Engineering H Area Includes: Operations Engineering Projects Technology Quality DWPF includes: S and Z Area: Production Engineering Technical

Other
Diversco

Attachment 7-2 Goal Setting Flow Diagram



Attachment 7-3 1992 Goal Development Schedule



Attachment 7-4 Radiation Exposure Worksheet

RADIATION EXPOSURE WORKSHEET

FACILITY/WORK GROUP: _____

MANAGER: _____ DATE: _____

PART I

Activity	Estimated Total Exposure	Percent Completed Jan-Apr	May-Aug	Sep-Dec	Percent of Exposure per Work Group	Final Yearly Exposure
A. Base Routine Operations						
B. Special Work Operations						
	Total: REM Activity Total for the year					Total: REM Facility/Work Group Total

PART II

List specific ALARA Actions to Reduce Exposures on above work/jobs.
Reference to sections in Part I.

Attachment 7-5 Example of Facility Radiation Exposure Worksheet

RADIATION EXPOSURE WORKSHEET

FACILITY/WORK GROUP: I Area - Facility W

MANAGER: XXXXX DATE: 8/23/91

PART I

Activity	Estimated Total Exposure	Percent Completed Jan-Apr	May-Aug	Sep-Dec	Percent of Exposure per Work Group	Final Yearly Exposure
A. Base Routine Operations Jan - Dec	40 REM	33	34	33	35 % Operations 20% Maintenance 15% Technical 15% Quality 10% HP	36 REM
B. Special Work Operations						
1. SJ 92-01 Jan - Nov	25 REM	60	20	20	10% Maintenance 70% Construction 20% HP	2.5 REM
2. SJ 92-02 May - Sept	4 REM	0	80	20	40% Operations 40% Maintenance 10% Technical 5% Quality 5% HP	3.8 REM
3. SJ 92-03 Apr - Dec	0.5 REM	20	30	50	10% Operations 80% Construction 10% HP	0.05 REM
	Total: 69.5 REM Activity Total for the year					Total: 42.35 REM Facility/Work GroupTotal

PART II

List specific ALARA Actions to Reduce Exposures on above work/jobs. Reference to sections in Part I.

B.1 - Use of special remote tooling, workers trained on mock-ups, more effective use of containments.

B.2 - Equipment modifications prefabricated outside RCA, design review, use of flow diagram and shielding report.

Attachment 7-6 Example of Work Group Radiation Exposure Worksheet

RADIATION EXPOSURE WORKSHEET

FACILITY/WORK GROUP: 1 Area - Construction

MANAGER: XXXXX DATE: 8/23/91

PART I

Activity	Estimated Total Exposure	Percent Completed Jan-Apr	May-Aug	Sep-Dec	Percent of Exposure per Work Group	Final Yearly Exposure
A. Base Routine Operations						
B. Special Work Operations						
1. SJ 92-01 Jan - Oct	17.5 REM	60	20	20	100% Construction	17.5 REM
2. SJ 92-03 May - Sept	0.4 REM	0	80	20	100% Construction	0.4 REM
	Total: 17.9 REM Activity Total for the year					Total: 17.9 REM Facility/Work Group Total

PART II

List specific ALARA Actions to Reduce Exposures on above work/jobs.
Reference to sections in Part I.