Revised: 6/19/2003 2:18 PM

Revised: 7/3/2003 10:54 AM

CHAPTER FOUR
LONG–RANGE HUMAN RESOURCE PLANNING

1 INTRODUCTION

1.1 Human resource planning skills

1.1.1 The pace of change in civil aviation is creating profound changes in the discipline of human resource planning. The era of treating an organization's human resources in the same manner as material resources, using a model based on stock control, forecasting and replenishment - is no longer effective. It now calls for skills that require an understanding of human performance as well as the numerical aspect of the human resource planning.

1.1.2 Themes that should dominate throughout human resource planning are:

Plan to avoid being taken by surprise

Fully utilize the people you already have

Communicate regularly with the personnel concerned

1.2 Impact of Change on Human Resource Planning

1.2.1 Long-range (3-5 years) human resource planning is a meticulous exercise. Plans must handle and optimize the gradual changing balance of human resource supply and demand and project this ahead. The job-by-job demand, broken down into required skills and experience, and taking into account the forecast of all the variables such as retirements and promotions can be assembled in a multi-dimensional spreadsheet and manipulated to produce recruitment, training and redundancy plans

1.2.2 In modern organizational structures that have job descriptions that are likely to change, the mechanical process of human resource planning requires human judgment to be realistic. In a more modern process, systematic human resource planning is being somewhat replaced by a planning methodology, driven principally by the forecast changes in the nature and/or quantity of the demand, service provider, organizational structure and staffing strategies (for example the out-sourcing of a service). The introduction of new technology also creates a need for revised staff planning

1.3 The Fundamental Model

1.3.1 The basic information required to determine future human resource needs includes status of existing staff, recruitment plans, promotion, transfers and re-skilling of staff through training. Resignations, redundancies, retirements are also important factors. In some States, the decision to contract-out jobs or services will also need to be taken into consideration.

1.3.2 A purely mathematical approach to projecting future human resource needs, similar to a stock control system, is only the starting point. One problem with a purely mathematical

approach to human resource planning is that a particular skill or group of skills may be common to several different jobs, unlike material resources. With humans, there are an inexhaustible number of combinations of skills, knowledge, attitudes and personality traits that determine whether or not personnel should be assigned to a job.

1.3.3 There are also other problems such as, the skills required to perform a job that are continually evolving, staff not using specific skills in their present job gradually lose those skills and people acquire skills informally without it being recorded. Systematic cataloguing of skills and levels of responsibility is a complex and difficult task.

1.4 Local Level Planning

1.4.1 One approach to human resource planning is to shift from the model that provides only generalized results, to a more custom approach that provides more distinctive local planning solutions. This would be based on the specific circumstances such as operational parameters, staff requirements and rostering for each division of the organization. In this way, human resource planning becomes more decentralized and more effective.

1.4.2 At the local level, straightforward and common-sense estimates of future human resource demands can often be made through an assessment of the detailed local workload, and knowledge of imminent local changes such as new equipment or procedures. This is now a simpler task, one that calls only for normal management skills.

1.4.3 Eventually, the above information should be collected and analyzed continuously by a central planning body that would allow for a better overall national rationalization of human resources.

1.5 Succession Planning

Succession planning is a formalized process that helps organizations manage employee growth and development to ensure individual and organizational success.
An effective succession plan enables an organization to identify and prepare the right people for the right positions at the right time.

1.5.1 Succession planning for ATCOs would follow from recruitment, initial training and on-the-job training leading to formal license, followed by further training, formal and on-the-job, leading to ratings and endorsements. It would also include any changing profile of the staff member. Table 1 illustrates an example of a possible controller training period of two years. However this period varies significantly from State-to-State. It is essential therefore that planning be undertaken to ensure that inputs to the system arrive at the appropriate time.

Unit	Subject	Training period (approximate number in weeks)
1) Formal training centre	Basic controller training	16
2) ATC unit (tower/approach/area control)	Familiarization and initial on-the-job training	24
3) Specialized training school	Control tower, approach control and area control training	16
4)ATC Unit	On-the job training	12
5) Additional formal training at training centre	Air traffic control system training	12
6) Assigned ATS unit	Further on-the-job training for local training	24
		104 weeks (2 years)

Table 1. Sample curriculum for initial ATC training[1]

1.5.2 While paragraph 1.5.1 outlines requirements for air traffic control, the need for succession planning is equally true for all the aviation disciplines. Air traffic control is emphasized because of the complex need for on-the-job training in a real-time environment.

1.5.3 Human resource planners and management, must attract, recruit and retain staff. They need to track knowledge and competencies effectively and identify where gaps arise between current and future requirements. They need to work closely and have the confidence of both senior management and the staff that are included in their planning.

1.5.4 A critical human resource activity is to develop a culture of continuous learning for individuals. This is where an organization-wide succession planning process will become an essential organizational asset. An effective succession plan enables an organization to identify and prepare the right people for the right positions at the right time, and to identify, secure and increase an organization's knowledge and skill base.

1.6 The Human Resources Inventory

1.6.1 A human resource manager should prepare a human resource plan that is in harmony with the organization's strategic and operational plans, on the basis of the personnel records (from the organization's records) which contains details of staff including their personal profiles, career plans and individual development programmes. In practice, when starting to develop a human resource planning technique, there may be no clear strategic plan that covers the human resource area. Often, available plans are merely short-term budgetary exercises. Personal data is often limited and does not include the changing profile of the staff, because there is no systematic appraisal system to provide this information.

[1] Part IV – ATS organization, administration and facility management, Section 1, Chapter 3 – Training and proficiency requirements ATM Planning Manual

1.6.2 The human resource planners should work with individual divisional chiefs to build up skills inventories and needs based on what they really know about staffing requirements. The human resource planner will also need to work with supervisors and many other personnel within the various branches of the organization in order to obtain the following essential data:

- organizational chart;
- job inventory and descriptions;
- inventory of equipment, machinery (for technical skills inventory);
- analysis of existing staff strength, by job, and by location; and
- up-to-date personnel data on resignations and retirements.

2 DEVELOPMENT OF A HUMAN RESOURCE PLAN

2.1 Human resource strategic planning

2.1.1 Human resource strategic planning matches the requirements of the organization to the availability of personnel, in numbers and skills, to determine the redeployment, recruitment or early retirement programmes for the next three to five years. It is a dynamic process, which requires a regular analysis and update. When developing the human resource plan, the planners, in addition to their direct working relations with the operational supervisors, also need to have close communications with senior level management from both the personnel and operations departments. Figure 1 represent a graphical approach to human resource planning.

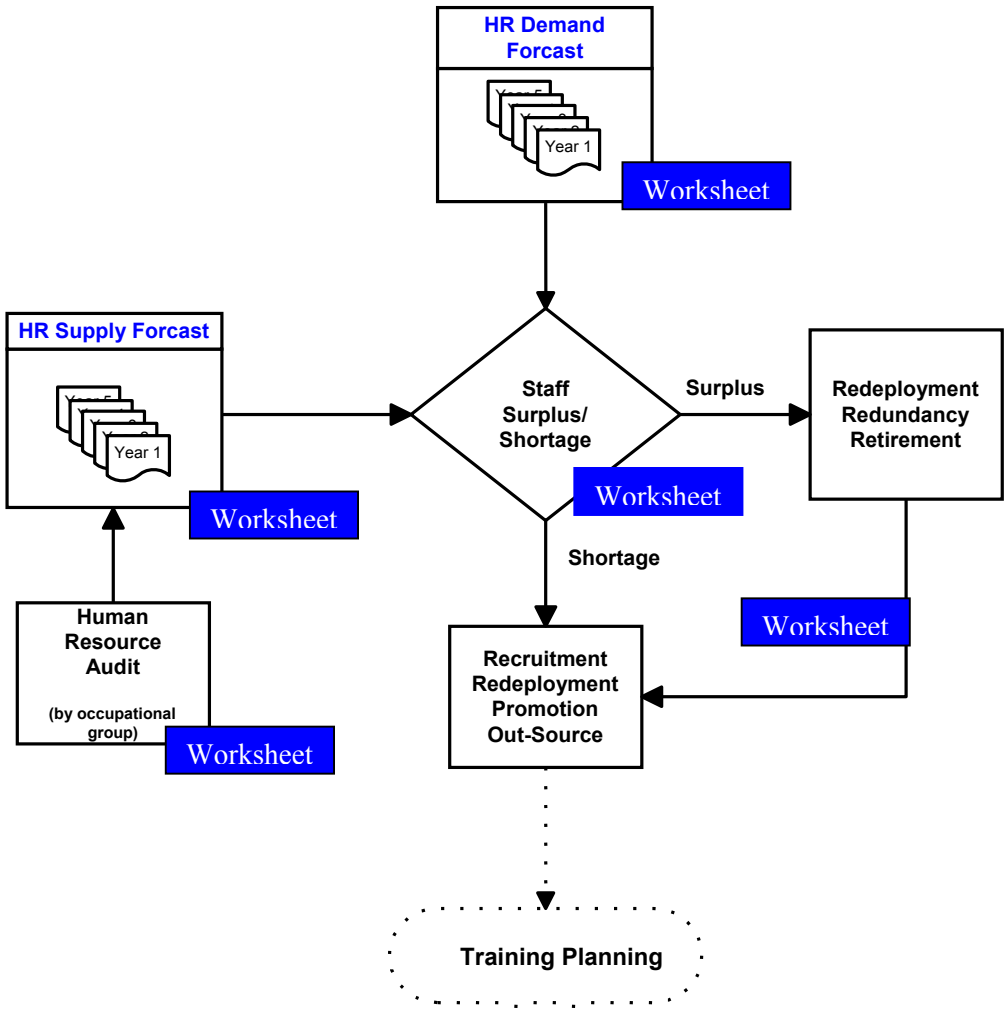

Figure 1 Human Resource Planning

2.2 Civil Aviation and Technological Changes

2.2.1 Due to both the volume of air traffic and technology changes; human resource planning is a major challenge for management in civil aviation today. To illustrate this, in rescue fire-fighting, new technology made it possible to reduce the number of fire-fighters on a single fire truck from 10 to 3, and now, using the latest aerodrome fire trucks, to one (driver/fire-fighter). A shift to radar from conventional air traffic control has changed the skills required of air traffic controllers and those who maintain the equipment. It is anticipated that the greater use of satellite navigation and new communications and surveillance technologies, the number of staff required to support ATS facilities in time will be reduced. However during the transition phase the reverse may be expected. There are many such developments, which will have an impact on human resource planning.

2.3 Fundamental Approach to the Human Resource Plan

2.3.1 The approach recommended and used to illustrate the process, is the use of a software spreadsheet application programme such as the Microsoft Excel. Each major step utilizes a worksheet within a single workbook. The process illustrated in this manual, uses worksheets with unique names obtained from the planning steps in Figure 1. Each worksheet is linked to the appropriate following step in the process.

2.3.2 Figure 2 identifies the worksheets required for the planning process. Samples of these worksheets are included in this chapter

Microsoft Excel - NewCNSHrpData-3b.xls

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	A	B	C
3	CNS DIVISION PLANNING		
4	WORKSHEETS USED FOR DETERMINEING HUMAN RESOURCE NEEDS OVER PLANNING PERIOD - YEARS 1 TO 5		
5	WORKSHEET NO.	TITLE	REMARKS
6	1	PERSONNEL DATABASE	WS-1 CNS Dbase
7	2	POST REQUIRED TO SUPPORT OPERATIONAL REQUIREMENTS	WS-2 HR Needs CNSInvData18)
8	3A	STAFF REQUIREMENTS - AUDIT (NO.1)	WS-3A Audit-CNS
9	3B	HUMAN RESOURCE AUDIT (NO.2)	WS-3B-9 CNS
10	4A	PREPARATION OF BASE YEAR STATUS	WS-3B-9 CNS
11	4B	EXPECTED STATUS OF PLANNING YEAR 1	WS-3B-9 CNS
12	4C	EXPECTED STATUS OF PLANNING YEAR 2	WS-3B-9 CNS
13	4D	EXPECTED STATUS OF PLANNING YEAR 3	WS-3B-9 CNS
14	4E	EXPECTED STATUS OF PLANNING YEAR 4	WS-3B-9 CNS
15	5	SUPPLY FORECAST FOR PLANNING YEARS 1 - 5	WS-3B-9 CNS
16	6	DEMAND FORECAST (YEARS 1 - 4)	WS-3B-9 CNS
17	7	DIFFERENCE FORECAST (YEARS 1 - 4)	WS-3B-9 CNS
18	8	PROMOTION/REDEPLOYMENT/RECRUITMENT BASE YEAR 1	WS-3B-9 CNS
19	9	STATUS BASE YEAR 1 WITH INPUTS FROM WORKSHEET 8	WS-3B-9 CNS
20	10	EFFECTS OF YEAR 1 CHANGES OVER 5 YEAR PERIOD	

Figure 2 Worksheets used for HR Planning, Years 1 to 5

2.3.3 To illustrate this human resource planning process, a hypothetical CNS (communication, navigation, and surveillance) section within a civil aviation organization was used. There is no relation to this illustration and any specific organization; however, the titles and figures entered into the worksheets are typical of what could be found within an actual organization.

2.4 Personnel Database – CNS Maintenance (*Figure* 3- *Worksheet 1*)

2.4.1 It is preferable if a listing be produced (if not already available) of all CNS positions within the organization. This should include both operational, non-operational and management

positions. It is sufficient enough to produce a simple outline of the titles and where the posts are active, i.e. headquarters, planning office, specific aerodrome control tower, or area control centre.

2.4.2 Figure 3 (*Worksheet 1*) demonstrates a personnel database. This is the same type of worksheet used for the ATC as demonstrated in Appendix A of Chapter 2. Again, the worksheet utilizes the "Data / Filter / Auto filter" mode. This enables the worksheet to act as a small database and filter out a variety of results. The user of *Worksheet 1*, is required to enter a "1" or "0" into the appropriate cell in cell block D5…H34 (not shown in Figure 1). A "1" represents the requirement for that post in the specific location and a "0" represents no requirement for the post. Figure 3 (*Worksheet 1*) shows a "*drop-down*" list for an area control centre (ACC). If Item "1" is selected from the drop-down list, then the worksheet will indicate that the specific post is required for this facility category (ACC).

2.4.5 A useful aspect of "*Worksheet 1*" is the ability of linking the worksheet data such as *Posts* and *Post Code* to other worksheets within this and other workbooks. This action ensures the accuracy of this data in all worksheets and, reduces the amount of work if replacement of data is necessary. This approach is also demonstrated in the Case Study in Chapter 8.

Microsoft Excel - NewCNSHrpData-3b.xls

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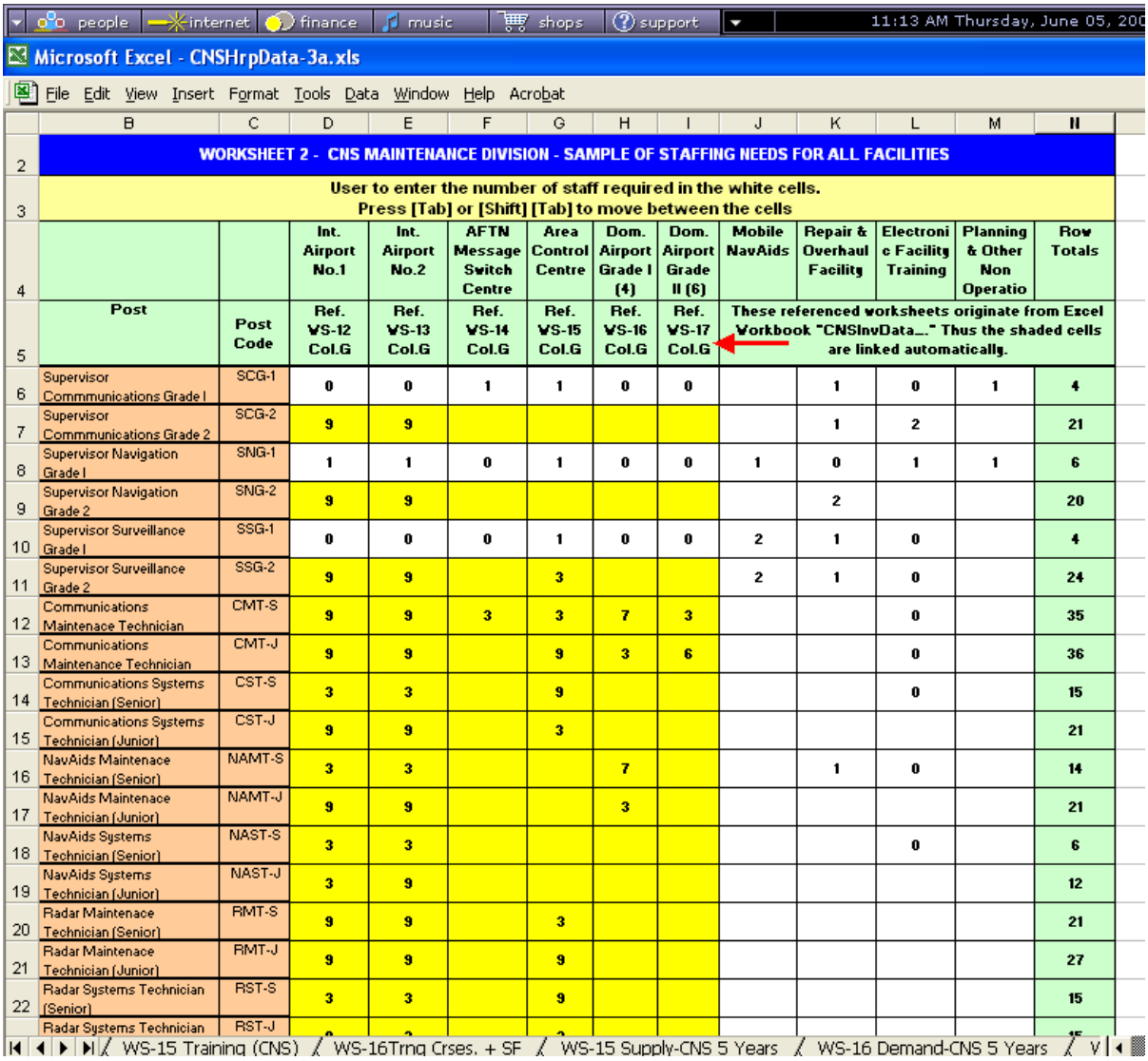
	A	B	C	D	E	F	G	H	I
1	WORKSHEET 1 - CNS DIVISION PERSONNEL DATABASE								
2	Notice for Users: There is NO User Data Entry into this Worksheet								
3	Data is linked from Workbook: CNSInvData-3.xls / CNS Post Db								
4	S/N	Post	Post Cod	IA1	IA2	ACC	AFTN	DOM	DOM2
5	1	Supervisor Commmunications Grade I	SCG-1	1			0	0	0
6	2	Supervisor Commmunications Grade 2	SCG-2	1			1	0	0
7	3	Supervisor Navigation Grade I	SNG-1	1			0	0	0
8	4	Supervisor Navigation Grade 2	SNG-2	0			0	0	0
9	5	Supervisor Surveillance Grade I	SSG-1	1			0	0	0
10	6	Supervisor Surveillance Grade 2	SSG-2	0				0	0
11	7	Communications Maintenace Technician (Senior)	CMT-S	1				1	1
12	8	Communications Maintenance Technician (Junior)	CMT-J	1	1	1			1
13	9	Communications Systems Technician (Senior)	CST-S	1	1	1			0
14	10	Communications Systems Technician (Junior)	CST-J	1	1	1			0
15	11	NavAids Maintenace Technician (Senior)	NAMT-S	1	1	0			0
16	12	NavAids Maintenace Technician (Junior)	NAMT-J	1	1	0	0	1	0
17	13	NavAids Systems Technician (Senior)	NAST-S	1	1	0	0	0	0
18	14	NavAids Systems Technician (Junior)	NAST-J	0	0	0	0	0	0
19	15	Radar Maintenace Technician (Senior)	RMT-S	1	1	1	0	0	0
20	16	Radar Maintenace Technician (Junior)	RMT-J	1	1	1	0	0	0
21	17	Radar Systems Technician (Senior)	RST-S	1	1	1	0	0	0
22	18	Radar Systems Technician (Junior)	RST-J	1	1	1	0	0	0
23	19	Radar Data Processor Technician (Senior)	RDT-S	1	1	1	0	0	0
24	20	Radar Data Processor Technician (Junior)	RDT-J	1	1	1	0	0	0
25	21	Miscellaneous Maintenace Technician (Junior)	MMT-J	1	1	0	0	0	0
26	22	Miscellaneous Maintenace Technician (Senior)	MMT-S	1	1	0	0	0	0
27	23	Message Switch Technician (Senior)	MST-S	1	1	1	1	0	0
28	24	Message Switch Technician (Junior)	MST-J	1	1	1	1	1	0
29	25	Message Switch Software Technician (Senior)	MSDT-S	0	0	0	1	0	0
30	26	Message Switch Software Technician (Junior)	MSDT-J	0	0	0	1	0	0
31	27	Electro-Mechanical Devices Technician (Senior)	EMDT-S	1	1	1	1	0	0
32	28	Electro-Mechanical Devices Technician (Junior)	EMDT-J	1	1	1	1	1	1
33	29	Software Maintenance Technician (Senior)	SWMT-S	1	1	0	1	0	0
34	30	Software Maintenance Technician (Junior)	SWMT-J	1	1	0	1	0	0
35	31	Totals:		25	25	19	10	6	3

(All)
(Top 10...)
(Custom...)
0
1
19
(Blanks)
(NonBlanks)

Select "1" to identify all the ACC posts.

Figure 3 (*Worksheet 1*), CNS Division Personnel Data Base

2.5 CNS Maintenance.--Post Required to Support Operational Requirements (*Worksheet 2*)



Microsoft Excel - CNSHrpData-3a.xls

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WORKSHEET 2 - CNS MAINTENANCE DIVISION - SAMPLE OF STAFFING NEEDS FOR ALL FACILITIES

User to enter the number of staff required in the white cells.
Press [Tab] or [Shift] [Tab] to move between the cells

Post	Post Code	Int. Airport No.1	Int. Airport No.2	AFTN Message Switch Centre	Area Control Centre	Dom. Airport Grade I (4)	Dom. Airport Grade II (6)	Mobile NavAids	Repair & Overhaul Facility	Electronic Facility Training	Planning & Other Non Operatio	Row Totals
		Ref. WS-12 Col.G	Ref. WS-13 Col.G	Ref. WS-14 Col.G	Ref. WS-15 Col.G	Ref. WS-16 Col.G	Ref. WS-17 Col.G	These referenced worksheets originate from Excel Workbook "CNSInvData..." Thus the shaded cells are linked automatically.				
Supervisor Commmunications Grade I	SCG-1	0	0	1	1	0	0		1	0	1	4
Supervisor Commmunications Grade 2	SCG-2	9	9						1	2		21
Supervisor Navigation Grade I	SNG-1	1	1	0	1	0	0	1	0	1	1	6
Supervisor Navigation Grade 2	SNG-2	9	9						2			20
Supervisor Surveillance Grade I	SSG-1	0	0	0	1	0	0	2	1	0		4
Supervisor Surveillance Grade 2	SSG-2	9	9		3			2	1	0		24
Communications Maintenace Technician	CMT-S	9	9	3	3	7	3			0		35
Communications Maintenance Technician	CMT-J	9	9		9	3	6			0		36
Communications Systems Technician (Senior)	CST-S	3	3		9					0		15
Communications Systems Technician (Junior)	CST-J	9	9		3							21
NavAids Maintenace Technician (Senior)	NAMT-S	3	3			7			1	0		14
NavAids Maintenace Technician (Junior)	NAMT-J	9	9			3						21
NavAids Systems Technician (Senior)	NAST-S	3	3							0		6
NavAids Systems Technician (Junior)	NAST-J	3	9									12
Radar Maintenace Technician (Senior)	RMT-S	9	9		3							21
Radar Maintenace Technician (Junior)	RMT-J	9	9		9							27
Radar Systems Technician (Senior)	RST-S	3	3		9							15
Radar Systems Technician	RST-J											

WS-15 Training (CNS) / WS-16Trng Crses. + SF / WS-15 Supply-CNS 5 Years / WS-16 Demand-CNS 5 Years

Figure 4 (*Worksheet 2)*, CNS Human Resource Needs

2.5.1 Figure 4 (*Worksheet 2 Human Resource Needs*) is the worksheet that identifies the type and number of staff needed in order to support the CNS maintenance within air traffic services facilities. The user is required to enter appropriate figures into the "white" cells. All other cells are automatic inputs. For example, columns "B" and "C" originate from Figure 3 (*Worksheet 1*) the CNS Division Personnel Database. With the exception of the white cells, columns "D" to "I" originate from worksheets 12 to 17 of an Excel file named "CNSInv Data" workbook (used in the case study, Chapter 8). These worksheets determine staff requirements for operational working hours. Figure 4 shows a portion of a completed *Worksheet 2*. This activity is also covered in Chapter 8, Case Study.

3. THE STATUS OF HUMAN RESOURCE

3.1 Human Resource Audit

3.1.1 The next step for all disciplines is to determine the existing human resource supply for each discipline. This information is gathered in a process referred to as a human resource audit. The information should be entered in an appropriate worksheet, which can then be utilized to analyze the current situation and to project human resource needs and training requirements over a planning perod. While this audit may be conducted using appropriate paper forms, the approach used in this manual is utilization of electronic worksheets.

3.1.2 In the audit considered here, we only require the numbers of staff (budgeted and actual) for the appropriate posts under consideration. However, the human resource planners should also obtain (or ensure their availability) from the appropriate branches, the following details of staff:

- educational history and qualifications prior to recruitment;
- current qualifications including, specialized courses and instructor training;
- management and supervisor training; and
- personal details.

In Figure 5, this activity is entitled "*human resource audit*". A copy of the staffing tables and job descriptions will provide the basic data and typically are available from a personnel department.

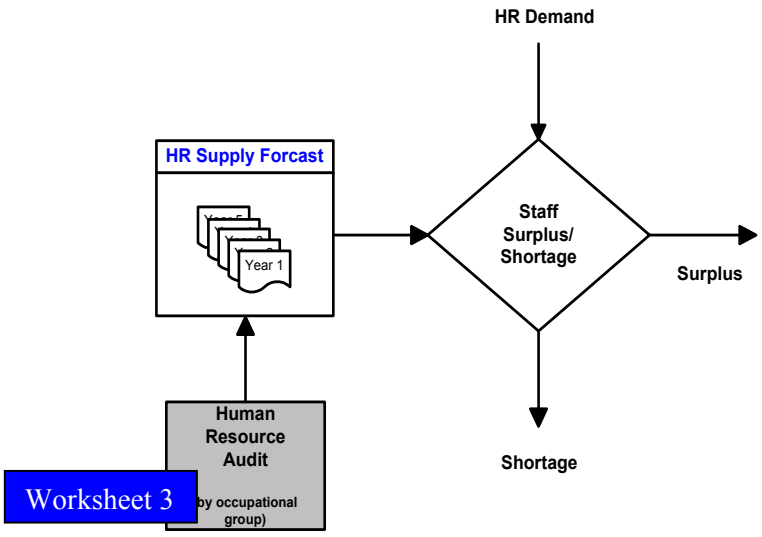
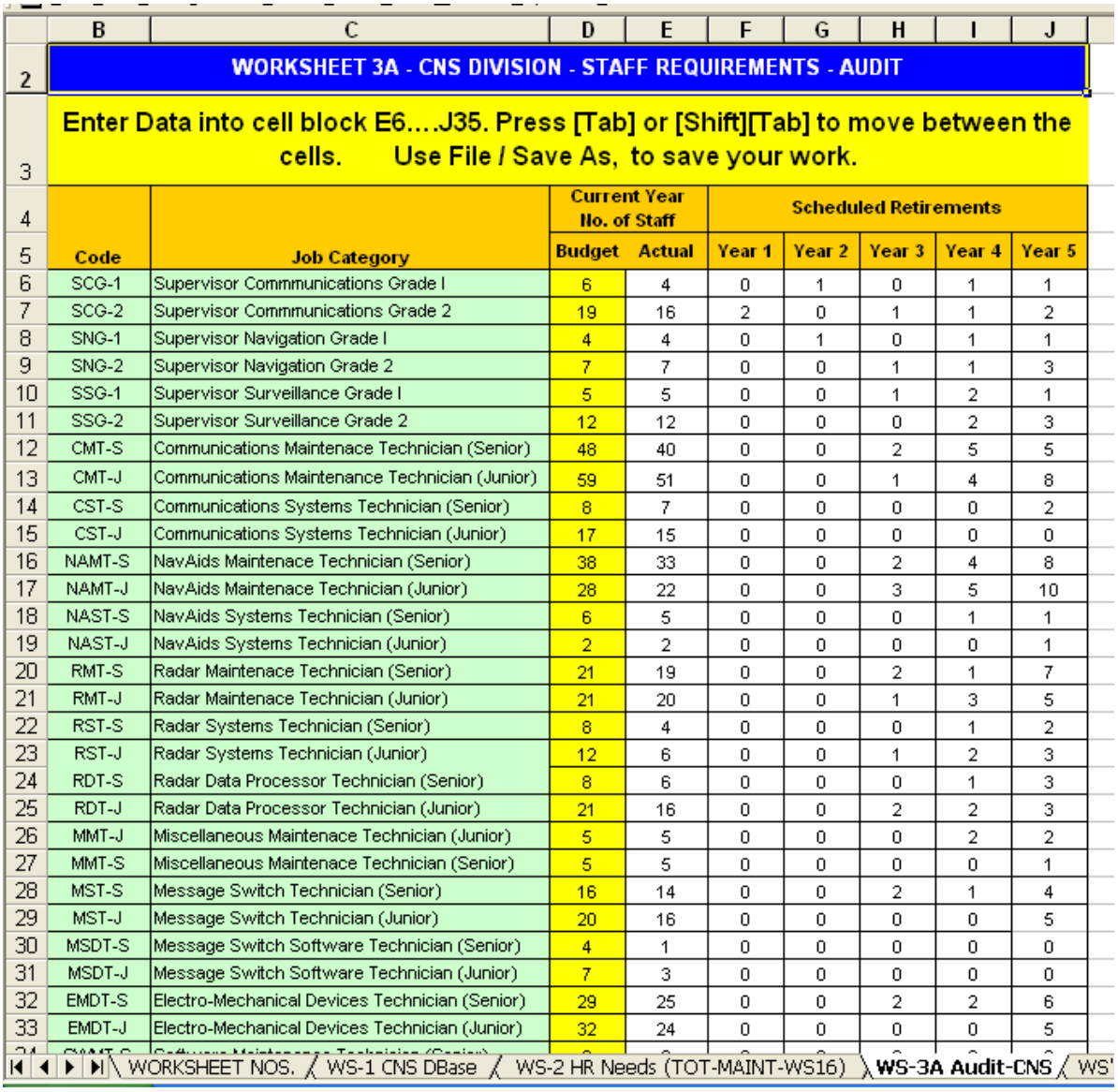


Figure 5 Human Resource Audit

3.2 The Audit Form Figure 6 (*Worksheet 3A*)

3.2.1 All CNS Division jobs are linked from Figure 3 (Worksheet 1) to columns "B" and "C" of Figure 6 (Worksheet 3A). In addition, the current year "budget staff" figures are linked from Figure 4 (Worksheet 2), CNS HR needs. Following this, the actual numbers of persons who occupy each position for the current year, called the "*base year"* is entered into the white cells of column "E". The next step is for the user to collect information on the numbers of employees who expect to retire each year for the planning period (in this example year 1 to 5). This information

should be entered into the appropriate columns and rows (white cell block E6 to J35) on the *Human Resource Audit worksheet*.



WORKSHEET 3A - CNS DIVISION - STAFF REQUIREMENTS - AUDIT

Enter Data into cell block E6....J35. Press [Tab] or [Shift][Tab] to move between the cells. Use File / Save As, to save your work.

Code	Job Category	Current Year No. of Staff		Scheduled Retirements				
		Budget	Actual	Year 1	Year 2	Year 3	Year 4	Year 5
SCG-1	Supervisor Commmunications Grade I	6	4	0	1	0	1	1
SCG-2	Supervisor Commmunications Grade 2	19	16	2	0	1	1	2
SNG-1	Supervisor Navigation Grade I	4	4	0	1	0	1	1
SNG-2	Supervisor Navigation Grade 2	7	7	0	0	1	1	3
SSG-1	Supervisor Surveillance Grade I	5	5	0	0	1	2	1
SSG-2	Supervisor Surveillance Grade 2	12	12	0	0	0	2	3
CMT-S	Communications Maintenace Technician (Senior)	48	40	0	0	2	5	5
CMT-J	Communications Maintenance Technician (Junior)	59	51	0	0	1	4	8
CST-S	Communications Systems Technician (Senior)	8	7	0	0	0	0	2
CST-J	Communications Systems Technician (Junior)	17	15	0	0	0	0	0
NAMT-S	NavAids Maintenace Technician (Senior)	38	33	0	0	2	4	8
NAMT-J	NavAids Maintenace Technician (Junior)	28	22	0	0	3	5	10
NAST-S	NavAids Systems Technician (Senior)	6	5	0	0	0	1	1
NAST-J	NavAids Systems Technician (Junior)	2	2	0	0	0	0	1
RMT-S	Radar Maintenace Technician (Senior)	21	19	0	0	2	1	7
RMT-J	Radar Maintenace Technician (Junior)	21	20	0	0	1	3	5
RST-S	Radar Systems Technician (Senior)	8	4	0	0	0	1	2
RST-J	Radar Systems Technician (Junior)	12	6	0	0	1	2	3
RDT-S	Radar Data Processor Technician (Senior)	8	6	0	0	0	1	3
RDT-J	Radar Data Processor Technician (Junior)	21	16	0	0	2	2	3
MMT-J	Miscellaneous Maintenace Technician (Junior)	5	5	0	0	0	2	2
MMT-S	Miscellaneous Maintenace Technician (Senior)	5	5	0	0	0	0	1
MST-S	Message Switch Technician (Senior)	16	14	0	0	2	1	4
MST-J	Message Switch Technician (Junior)	20	16	0	0	0	0	5
MSDT-S	Message Switch Software Technician (Senior)	4	1	0	0	0	0	0
MSDT-J	Message Switch Software Technician (Junior)	7	3	0	0	0	0	0
EMDT-S	Electro-Mechanical Devices Technician (Senior)	29	25	0	0	2	2	6
EMDT-J	Electro-Mechanical Devices Technician (Junior)	32	24	0	0	0	0	5

WORKSHEET NOS. / WS-1 CNS DBase / WS-2 HR Needs (TOT-MAINT-WS16) / **WS-3A Audit-CNS** / WS'

Figure 6 – (*Worksheet 3A*) Sample of Human Resource Audit

3.2.2 A separate worksheet should be completed for each department. A comparison of the established budget figures and actual staffing level may provide an indication of whether a category is over or under staffed. The scheduled number of employees to retire over the planning period also provides important information regarding the workforce status. The output of the Human Resource Audit Worksheet is used to provide inputs to the Human Resource Supply Forecast Worksheet.

3.2.3 Information on age and length of service, educational background, skills and training should be available from personnel records. At this point all that is needed is a breakdown of the types of jobs and the number of employees in each job. The completion of all *Human Resource Audit* worksheets provides human resource planners a total figure for the existing labour force. Figure 6 (*Worksheet 3A)*, shows the Human Resource Audit for a CNS Maintenance Division covering 23 jobs and grades. This worksheet identifies the actual staffing situation with respect to the confirmed budgeted posts. It also identifies the scheduled retirements for these posts over the planning period year 1 to year 5.

4 DETERMINE STAFF LOSS OR "WASTAGE"

4.1 The effect of previous years

4.1.1 The next step in an organization's human resource planning process is to estimate how the supply of human resources will vary in the future. Information on the number of employees that will retire was previously collected. Next, a human resource planner needs to consider staff loss or "*wastage*" (the reduction in staffing by premature retirement or other reasons).

4.2 Calculate a Wastage Rate

4.2.1 To calculate a "*wastage rate*", human resource planners first need to determine the number of employees who have left the department (excluding retirements), during the past two or more years and, divide that number by the total number of employees in a department at the beginning of the year. To obtain the rate as a percentage, use Formula 1 illustrated in Figure 7. If historical data is not available, a typical value for staff wastage per year is 3 percent.

4.2.2 Staff "wastage" rates may vary considerably. For example, one airport may find that it had a wastage rate of 10 percent. However, unless there is sufficient historical data available (i.e. approximately two years of data or more) to indicate differently, it is suggested to use an average staff "*wastage*" rate of 3 per cent. The example shown in Figure 8 using Formula 1, provides a staff "wastage" rate of 2.1 per cent. In the sample planning worksheets, the value of 3 percent is used. The formula shown below, to calculate staff wastage can be adjusted for sampling period (i.e. number of years). It is not recommended to use a sampling period of less than two years.

Formula 1: Wastage rate as a Percentage

$$\frac{\text{Number of employees who left the department in previous 5 years} \times 100}{\text{Number of employees in the department at start of year} \times \text{5 (number of years)}}$$

Figure 7 Wastage rate as a percentage formula

Sample

Total employees at beginning of year: 268

Number of employees who left the department in previous 5 years: 28

Using Formula 1

Staff wastage rate: = $\frac{28 \times 100}{268 \times 5}$ = 2.1 %

Figure8 Sample wastage rate

5. THE SUPPLY FORECAST WORKSHEET

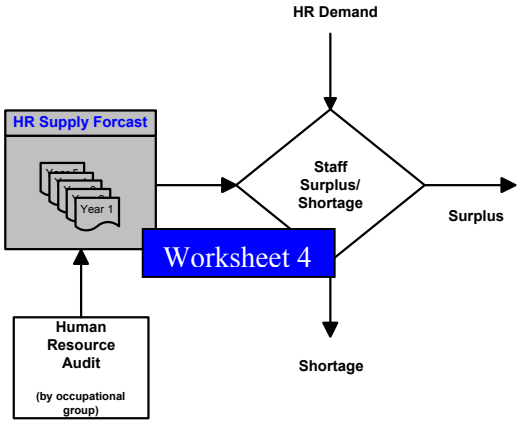


Figure 9 Human Resource Supply Forecast

5.1 Staffing status for each year of planning period

5.1.1 The first step in determining the supply forecast for a department/division, is to determine the expected staffing status at the end of the first year (base year) and for all other years of the planning period. Figure 10 (*Worksheet 4A*) shows a worksheet that covers the base year.

5.1.2 Columns "B" and "C" contain the "*staff code*" and "*staff job category*". The data for these columns is linked from Worksheet 1 (Figure 3) as seen previously. Column "D" "*expected year start balance year 1*" is linked from a worksheet identified as "WS-3A Audit CNS" (sample shown in figure 10). Column "E" contains the "*wastage rate*" based on 3 percent "(refer to paragraph 4.2.2), entered by the user in white cell "B2". Column "F" "*planned retirements*" also originates from "WS-3A Audit CNS (figure 10)". In the case of the "base year" (year 1), the user is required to obtain the actual retirement data to enter into the white cells of column "G". Column "H" "*forecast or actual*" is automatically calculated.

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WORKSHEET 3A - CNS DIVISION - STAFF REQUIREMENTS - AUDIT

Enter Data into cell block E6....J35. Press [Tab] or [Shift][Tab] to move between the cells. Use File / Save As, to save your work.

Code	Job Category	Current Year No. of Staff		Scheduled Retirements				
		Budget	Actual	Year 1	Year 2	Year 3	Year 4	Year 5
SCG-1	Supervisor Communications Grade I	4	4	0	1	0	1	1
SCG-2	Supervisor Communications Grade 2	21	16	2	0	1	1	2
SNG-1	Supervisor Navigation Grade I	6	4	0	1	0	1	1
SNG-2	Supervisor Navigation Grade 2	20	7	0	0	1	1	3
SSG-1	Supervisor Surveillance Grade I	4	5	0	0	1	2	1
SSG-2	Supervisor Surveillance Grade 2	24	12	0	0	0	2	3
CMT-S	Communications Maintenace Technician (Senior)	35	33	0	0	2	5	5
CMT-J	Communications Maintenance Technician (Junior)	36	35	0	0	1	4	8
CST-S	Communications Systems Technician (Senior)	15	7	0	0	0	0	2
CST-J	Communications Systems Technician (Junior)	21	15	0	0	0	0	0
NAMT-S	NavAids Maintenace Technician (Senior)	14	12	0	0	2	4	8
NAMT-J	NavAids Maintenace Technician (Junior)	21	20	0	0	3	5	10
NAST-S	NavAids Systems Technician (Senior)	6	5	0	0	0	1	1
NAST-J	NavAids Systems Technician (Junior)	12	2	0	0	0	0	1

Figure 10 (*Worksheet 3A sample*) Staff requirements audit – CNS

5.1.3 For subsequent planning years (years 2 to 5), the user is required to enter a "0" in all white cells of Column "G". However, should the user decide to undertake a "what-if" analysis, he/she may enter any whole numbers into these cells. Column "I" will automatically calculate the expected year end balance. Users should remember to return all cells in column "G" to "0" after any future analysis undertaking.

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	B	C	D	E	F	G	H	I
1	WORKSHEET 4A - STATUS OF YEAR 1 (BASE YEAR)							
2	3	Wastage rate	Expected Year Start		Planned Year 1	Enter "0" or Actuals	Forecast or Actual	Expected Year End Balance
3	499	Demand	Year 1	Wastage	Retirements			Year 1
4	SCG-1	Supervisor Commmunications Grade I	4	0	0	0	0	4
5	SCG-2	Supervisor Commmunications Grade 2	16	0	0	0	0	16
6	SNG-1	Supervisor Navigation Grade I	4	0	0	0	0	4
7	SNG-2	Supervisor Navigation Grade 2	7	0	0	0	0	7
8	SSG-1	Supervisor Surveillance Grade I	5	0	0	0	0	5
9	SSG-2	Supervisor Surveillance Grade 2	12	0	0	0	0	12
10	CMT-S	Communications Maintenace Technician (Seni	33	1	0	0	0	32
11	CMT-J	Communications Maintenance Technician (Jur	35	1	0	0	0	34
12	CST-S	Communications Systems Technician (Senior)	7	0	0	0	0	7
13	CST-J	Communications Systems Technician (Junior)	15	0	0	0	0	15
14	NAMT-S	NavAids Maintenace Technician (Senior)	12	0	0	0	0	12
15	NAMT-J	NavAids Maintenace Technician (Junior)	20	1	0	0	0	19
16	NAST-S	NavAids Systems Technician (Senior)	5	0	0	0	0	5
17	NAST-J	NavAids Systems Technician (Junior)	2	0	0	0	0	2
18	RMT-S	Radar Maintenace Technician (Senior)	19	1	0	0	0	18
19	RMT-J	Radar Maintenace Technician (Junior)	20	1	0	0	0	19
20	RST-S	Radar Systems Technician (Senior)	8	0	0	0	0	8
21	RST-J	Radar Systems Technician (Junior)	9	0	0	0	0	9
22	RDT-S	Radar Data Processor Technician (Senior)	6	0	0	0	0	6
23	RDT-J	Radar Data Processor Technician (Junior)	16	0	0	0	0	16
24	MMT-J	Miscellaneous Maintenace Technician (Junior	5	0	0	0	0	5
25	MMT-S	Miscellaneous Maintenace Technician (Senior	5	0	0	0	0	5
26	MST-S	Message Switch Technician (Senior)	14	0	0	0	0	14
27	MST-J	Message Switch Technician (Junior)	16	0	0	0	0	16
28	MSDT-S	Message Switch Software Technician (Senior)	1	0	0	0	0	1
29	MSDT-J	Message Switch Software Technician (Junior)	3	0	0	0	0	3
30	EMDT-S	Electro-Mechanical Devices Technician (Senio	25	1	0	0	0	24
31	EMDT-J	Electro-Mechanical Devices Technician (Junio	24	1	0	0	0	23
32	SWMT-S	Software Maintenance Technician (Senior)	2	0	0	0	0	2
33	SWMT-J	Software Maintenance Technician (Junior)	0	0	0	0	0	0
34		Total	350	2	0	0	0	339
35		Shortages at end of base year (year 1)		160				
36		Total number of staff departed in year 1		2				

Figure 11 (*Worksheet 4A*) Status of base year (Year 1)

5.1.4 Figures 12, 13, 14 and 15 show partial sectors of completed "status worksheets" for the planning years (2 – 5).

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	B	C	D	E	F	G	H	I
41	WORKSHEET 4B - EXPECTED STATUS OF YEAR 2							
42	3	Wastage rate used (in %)						
43	499	Demand	Expected Year Start		Planned Year 2	Enter "0" or Actuals	Forecast or Actual	Expected Year End Balance
44	Code	Job Category	Year 2	Wastage	Retirements			Year 2
45	SCG-1	Supervisor Commmunications Grade I	4	0	1	0	1	3
46	SCG-2	Supervisor Commmunications Grade 2	16	0	0	0	0	15
47	SNG-1	Supervisor Navigation Grade I	4	0	1	0	1	3
48	SNG-2	Supervisor Navigation Grade 2	7	0	0	0	0	7
49	SSG-1	Supervisor Surveillance Grade I	5	0	2	0	2	3
50	SSG-2	Supervisor Surveillance Grade 2	12	0	0	0	0	11
51	CMT-S	Communications Maintenace Technician (Seni	32	1	3	0	3	28
52	CMT-J	Communications Maintenance Technician (Jur	34	1	0	0	0	33
53	CST-S	Communications Systems Technician (Senior)	7	0	0	0	0	7
54	CST-J	Communications Systems Technician (Junior)	15	0	0	0	0	14
55	NAMT-S	NavAids Maintenace Technician (Senior)	12	0	0	0	0	11
56	NAMT-J	NavAids Maintenace Technician (Junior)	19	1	0	0	0	19
57	NAST-S	NavAids Systems Technician (Senior)	5	0	0	0	0	5
58	NAST-J	NavAids Systems Technician (Junior)	2	0	0	0	0	2
59	RMT-S	Radar Maintenace Technician (Senior)	18	1	0	0	0	18
60	RMT-J	Radar Maintenace Technician (Junior)	19	1	0	0	0	19
61	RST-S	Radar Systems Technician (Senior)	8	0	0	0	0	8

Figure 12 (Worksheet 4B) Expected status of year 2

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	B	C	D	E	F	G	H	I
79	WORKSHEET 4C - EXPECTED STATUS OF YEAR 3							
80	3	Wastage rate used (in %)	Expected Year Start		Planned Year 3	Enter "0" or Actuals	Forecast or Actual	Expected Year End Balance
81	499	Demand	Year 3	Wastage	Retirements			Year 3
82	Code	Job Category						
83	SCG-1	Supervisor Commmunications Grade I	3	0	0	0	0	3
84	SCG-2	Supervisor Commmunications Grade 2	15	0	1	0	1	14
85	SNG-1	Supervisor Navigation Grade I	3	0	0	0	0	3
86	SNG-2	Supervisor Navigation Grade 2	7	0	1	0	1	5
87	SSG-1	Supervisor Surveillance Grade I	3	0	1	0	1	2
88	SSG-2	Supervisor Surveillance Grade 2	11	0	0	0	0	11
89	CMT-S	Communications Maintenace Technician (Seni	28	1	2	0	2	25
90	CMT-J	Communications Maintenance Technician (Jur	33	1	1	0	1	31
91	CST-S	Communications Systems Technician (Senior)	7	0	0	0	0	6
92	CST-J	Communications Systems Technician (Junior)	14	0	0	0	0	14
93	NAMT-S	NavAids Maintenace Technician (Senior)	11	0	2	0	2	9
94	NAMT-J	NavAids Maintenace Technician (Junior)	19	1	3	0	3	15
95	NAST-S	NavAids Systems Technician (Senior)	5	0	0	0	0	5
96	NAST-J	NavAids Systems Technician (Junior)	2	0	0	0	0	2
97	RMT-S	Radar Maintenace Technician (Senior)	18	1	2	0	2	15
98	RMT-J	Radar Maintenace Technician (Junior)	19	1	1	0	1	17

Figure 13 (Worksheet 4C) Expected status of year 3

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	B	C	D	E	F	G	H	I
118	WORKSHEET 4D - EXPECTED STATUS OF YEAR 4							
119	3	Wastage rate used (in %)	Expected Year Start		Planned Year 4	Enter "0" or Actuals	Forecast or Actual	Expected Year End Balance
120	499	Demand	Year 4	Wastage	Retirements			Year 4
121	Code	Job Category						
122	SCG-1	Supervisor Commmunications Grade I	3	0	1	0	1	2
123	SCG-2	Supervisor Commmunications Grade 2	14	0	1	0	1	12
124	SNG-1	Supervisor Navigation Grade I	3	0	1	0	1	2
125	SNG-2	Supervisor Navigation Grade 2	5	0	1	0	1	4
126	SSG-1	Supervisor Surveillance Grade I	2	0	2	0	2	0
127	SSG-2	Supervisor Surveillance Grade 2	11	0	2	0	2	9
128	CMT-S	Communications Maintenace Technician (Seni	25	1	5	0	5	19
129	CMT-J	Communications Maintenance Technician (Jur	31	1	4	0	4	26
130	CST-S	Communications Systems Technician (Senior)	6	0	0	0	0	6
131	CST-J	Communications Systems Technician (Junior)	14	0	0	0	0	13
132	NAMT-S	NavAids Maintenace Technician (Senior)	9	0	4	0	4	5
133	NAMT-J	NavAids Maintenace Technician (Junior)	15	0	5	0	5	10
134	NAST-S	NavAids Systems Technician (Senior)	5	0	1	0	1	3
135	NAST-J	NavAids Systems Technician (Junior)	2	0	0	0	0	2
136	RMT-S	Radar Maintenace Technician (Senior)	15	0	1	0	1	14
137	RMT-J	Radar Maintenace Technician (Junior)	17	1	3	0	3	14

Figure 14 (Worksheet 4D) Expected status of year 4

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	B	C	D	E	F	G	H	I
157	WORKSHEET 4E - EXPECTED STATUS OF YEAR 5							
158	3	Wastage rate used (in %)	Expected Year Start		Planned Year 5	Enter "0" or Actuals	Forecast or Actual	Expected Year End Balance
159	499	Demand	Year 5	Wastage	Retirements			Year 5
160	Code	Job Category						
161	SCG-1	Supervisor Commmunications Grade I	2	0	1	0	1	2
162	SCG-2	Supervisor Commmunications Grade 2	12	0	2	0	2	12
163	SNG-1	Supervisor Navigation Grade I	2	0	1	0	1	2
164	SNG-2	Supervisor Navigation Grade 2	4	0	3	0	3	4
165	SSG-1	Supervisor Surveillance Grade I	0	0	1	0	1	0
166	SSG-2	Supervisor Surveillance Grade 2	9	0	3	0	3	8
167	CMT-S	Communications Maintenace Technician (Seni	19	1	5	0	5	19
168	CMT-J	Communications Maintenance Technician (Jur	26	1	8	0	8	25
169	CST-S	Communications Systems Technician (Senior)	6	0	2	0	2	6
170	CST-J	Communications Systems Technician (Junior)	13	0	0	0	0	13
171	NAMT-S	NavAids Maintenace Technician (Senior)	5	0	8	0	8	5
172	NAMT-J	NavAids Maintenace Technician (Junior)	10	0	10	0	10	9
173	NAST-S	NavAids Systems Technician (Senior)	3	0	1	0	1	3
174	NAST-J	NavAids Systems Technician (Junior)	2	0	1	0	1	2
175	RMT-S	Radar Maintenace Technician (Senior)	14	0	7	0	7	13
176	RMT-J	Radar Maintenace Technician (Junior)	14	0	5	0	5	13

Figure 15 (Worksheet 4E) Expected status of year 5

5.2 Preparing the Supply Forecast *Worksheet 5* (Figure 16)

5.2.1 Figure16 (Worksheet.5) Human Resource Supply Forecast shows a sample of the summary of supply forecast for planning years 1 to 5. There are no user inputs to this worksheet all data is linked from other worksheets.

5.2.2 For continuity, the same CNS section and job categories that were used in the Human Resource Audit worksheet are repeated here and linked to columns "A: and "B" from *Worksheet 1 (*Figure 3). The figures in column "C" are linked from WS-3A Audit-CNS (figure 10) worksheet. Columns "D" to "H" are linked from their respect worksheets as shown in Figures 11 – 15.

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M6 =

WORKSHEET 5 - SUPPLY FORECAST YEARS 1 - 5

NO USER INPUT REQUIRED FOR THIS WORKSHEET

Code	Job Category	Number Staff Budgeted	Staff Base Year (1)	Supply Level Year 2	Supply Level Year 3	Supply Level Year 4	Supply Level Year 5
SCG-1	Supervisor Commmunications Grade I	4	3	3	3	2	1
SCG-2	Supervisor Commmunications Grade 2	21	15	12	11	9	7
SNG-1	Supervisor Navigation Grade I	6	3	2	0	-2	-3
SNG-2	Supervisor Navigation Grade 2	20	7	7	6	5	2
SSG-1	Supervisor Surveillance Grade I	4	4	2	-1	-3	-4
SSG-2	Supervisor Surveillance Grade 2	24	11	10	9	7	5
CMT-S	Communications Maintenace Technician (Senior)	35	32	30	27	23	20
CMT-J	Communications Maintenance Technician (Junior	36	34	33	32	28	23
CST-S	Communications Systems Technician (Senior)	15	7	7	5	4	3
CST-J	Communications Systems Technician (Junior)	21	15	14	14	13	13
NAMT-S	NavAids Maintenace Technician (Senior)	14	12	11	11	8	4
NAMT-J	NavAids Maintenace Technician (Junior)	21	19	19	18	15	9
NAST-S	NavAids Systems Technician (Senior)	6	4	3	2	1	0
NAST-J	NavAids Systems Technician (Junior)	12	2	2	2	1	0
RMT-S	Radar Maintenace Technician (Senior)	21	18	16	13	12	7
RMT-J	Radar Maintenace Technician (Junior)	27	19	19	17	16	11
RST-S	Radar Systems Technician (Senior)	15	8	8	7	6	4
RST-J	Radar Systems Technician (Junior)	15	9	8	7	6	4
RDT-S	Radar Data Processor Technician (Senior)	9	6	6	5	5	4
RDT-J	Radar Data Processor Technician (Junior)	27	16	15	13	12	11
MMT-J	Miscellaneous Maintenace Technician (Junior)	0	5	5	5	2	0

Figure 16 *(Worksheet.5)* Human Resource Supply Forecast, Planning Years 1 - 5

6. HUMAN RESOURCE DEMAND FORECAST

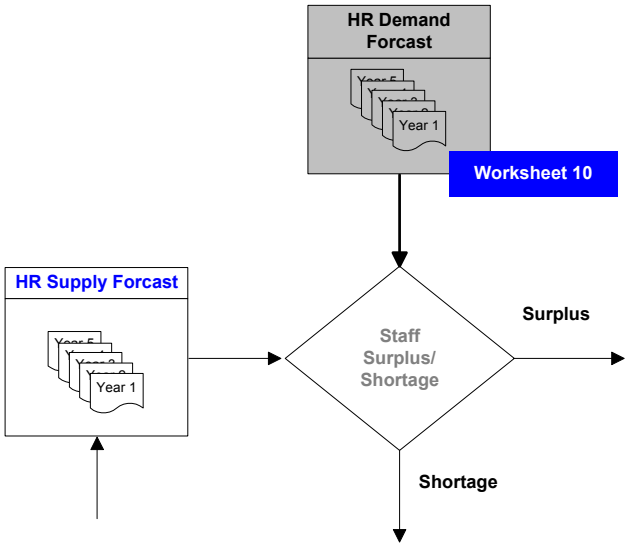


Figure 17 Human Resource Demand Forecast

6.1 Methodology to Identify the Human Resource Demand

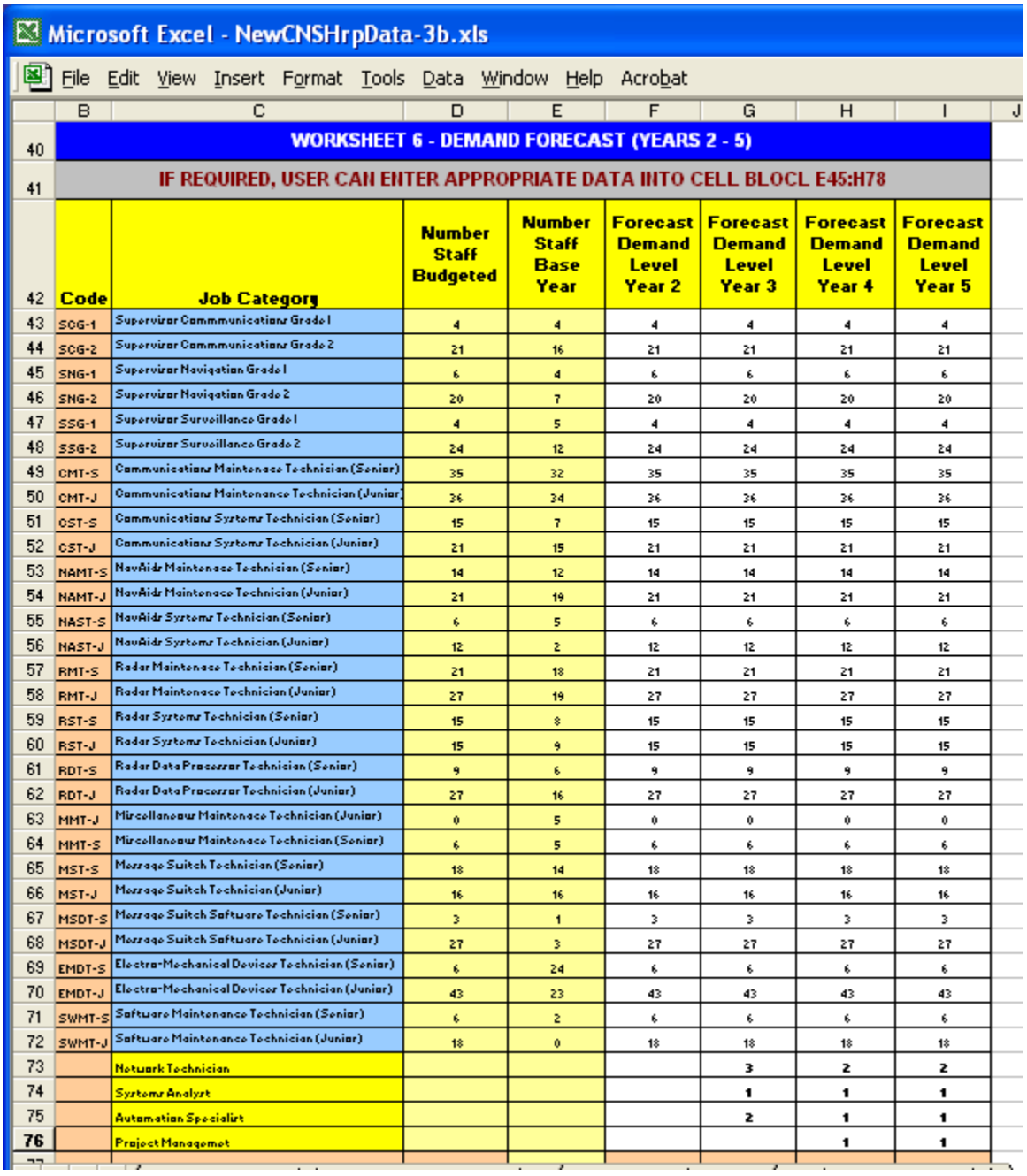
6.1.1 Chapter 2 of this manual outlined a methodology to identify the human resource needs in support of operational activities and includes such areas as staffing methodology, staffing factors, working conditions and constraints. Chapter 3 dealt with the subject of rostering. The methodologies and information from Chapters 2 and 3 are now utilized to prepare a human resource demand forecast, that is, an estimate of the human resources required in the future.

6.1.2 The type and volume of traffic and new technologies that will be implemented are the central issues that will affect future human resource needs. To calculate staffing requirements, it is necessary to make projections of the work required and the human resources needed to perform the work. For example, staffing levels for air traffic controllers can be determined on the basis of projections of estimated traffic growth and the complexity of the traffic. Discussions with managers such as the Director, Air Traffic Services and Chief, Air Traffic Services Planning, will also provide needed information including future plans of the organization, that will assist in projecting staffing needs. In addition, the strategic plans for an airport provide information concerning development of airport facilities over several years. Due to the dynamic nature of air traffic services, human resource projections need to be undertaken on a regular basis.

6.2 Building up to the Staffing Requirements from the Job Categories

6.2.1 Next, the global staffing requirements should be reduced to specific job categories in order to determine skill requirements. These would be the same categories used in the *human resource audit* unless new posts are created due to the possible introduction of new technology. A worksheet for each department will summarize this information for the planning period. Figure 18 (*Worksheet 6*) identifies the demand forecast for the CNS maintenance division. It covers the

same job positions as in the previous worksheets. But in this case, it includes four new positions that are introduced into the organization due to the introduction of automation, networking and the need for project management.



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WORKSHEET 6 - DEMAND FORECAST (YEARS 2 - 5)

IF REQUIRED, USER CAN ENTER APPROPRIATE DATA INTO CELL BLOCL E45:H78

Code	Job Categorg	Number Staff Budgeted	Number Staff Base Year	Forecast Demand Level Year 2	Forecast Demand Level Year 3	Forecast Demand Level Year 4	Forecast Demand Level Year 5
SCG-1	Supervisor Commmunicatians Grade I	4	4	4	4	4	4
SCG-2	Supervisor Commmunicatians Grade 2	21	16	21	21	21	21
SNG-1	Supervisor Navigation Grade I	6	4	6	6	6	6
SNG-2	Supervisor Navigation Grade 2	20	7	20	20	20	20
SSG-1	Supervisor Surveillance Grade I	4	5	4	4	4	4
SSG-2	Supervisor Surveillance Grade 2	24	12	24	24	24	24
CMT-S	Communicatians Maintenace Technician (Senior)	35	32	35	35	35	35
CMT-J	Communicatians Maintenance Technician (Junior)	36	34	36	36	36	36
CST-S	Communicatians Systems Technician (Senior)	15	7	15	15	15	15
CST-J	Communicatians Systems Technician (Junior)	21	15	21	21	21	21
NAMT-S	NavAidz Maintenace Technician (Senior)	14	12	14	14	14	14
NAMT-J	NavAidz Maintenace Technician (Junior)	21	19	21	21	21	21
NAST-S	NavAidz Systems Technician (Senior)	6	5	6	6	6	6
NAST-J	NavAidz Systems Technician (Junior)	12	2	12	12	12	12
RMT-S	Radar Maintenace Technician (Senior)	21	18	21	21	21	21
RMT-J	Radar Maintenace Technician (Junior)	27	19	27	27	27	27
RST-S	Radar Systems Technician (Senior)	15	8	15	15	15	15
RST-J	Radar Systems Technician (Junior)	15	9	15	15	15	15
RDT-S	Radar Data Procesrar Technician (Senior)	9	6	9	9	9	9
RDT-J	Radar Data Procesrar Technician (Junior)	27	16	27	27	27	27
MMT-J	Mircellaneaur Maintenace Technician (Junior)	0	5	0	0	0	0
MMT-S	Mircellaneaur Maintenace Technician (Senior)	6	5	6	6	6	6
MST-S	Message Suitch Technician (Senior)	18	14	18	18	18	18
MST-J	Message Suitch Technician (Junior)	16	16	16	16	16	16
MSDT-S	Message Suitch Saftuare Technician (Senior)	3	1	3	3	3	3
MSDT-J	Message Suitch Saftuare Technician (Junior)	27	3	27	27	27	27
EMDT-S	Electra-Mechanical Devicer Technician (Senior)	6	24	6	6	6	6
EMDT-J	Electra-Mechanical Devicer Technician (Junior)	43	23	43	43	43	43
SWMT-S	Saftuare Maintenance Technician (Senior)	6	2	6	6	6	6
SWMT-J	Saftuare Maintenance Technician (Junior)	18	0	18	18	18	18
	Network Technician				3	2	2
	Systems Analyst				1	1	1
	Automation Specialist				2	1	1
	Project Managemet					1	1

Figure 18 (*Worksheet 6*), Human Resource Demand Forecast

7 HUMAN RESOURCE PROMOTION/REDEPLOYMENT/RECRUITMENT PLAN

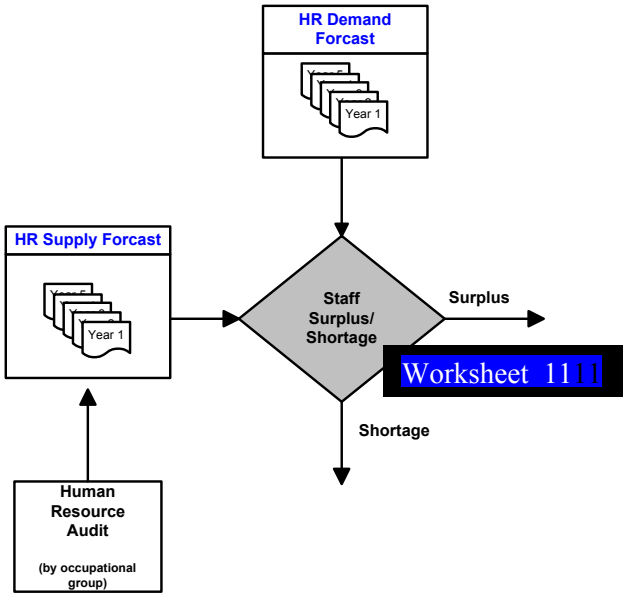

Figure 19 Human Resource Surplus/Deficit Forecast

7.1 Calculation of staff surpluses and deficits

7.1.1 The Human Resource Demand Forecast and the Human Resource Supply Forecast worksheets give, for each department by job category or occupational group, an estimate of the human resources available and required. The next step in the procedure is to compare the two figures and then to calculate surpluses and deficits. When a surplus exists in one job category, management will need to reduce supply through redeployment, early retirement or other action. When a deficit of staff exists, management would need to recruit, redeploy or promote staff to fill the vacancies.

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	C	D	E	F	G	H	I	J
86	WORKSHEET 7 - DIFFERENCE FORECAST (YEARS 1 - 5)							
87	NO USER INPUT REQUIRED FOR THIS WORKSHEET							
88	Job Category	Number Staff Budgeted	Staff Base Year	(+/-) Base Year 1	(+/-) Year 2	(+/-) Year 3	(+/-) Year 4	(+/-) Year 5
89	Supervisor Communications Grade I	4	4	0	-1	-1	-2	-2
90	Supervisor Communications Grade 2	21	16	-6	-6	-7	-9	-9
91	Supervisor Navigation Grade I	6	4	-2	-3	-3	-4	-4
92	Supervisor Navigation Grade 2	20	7	-13	-13	-15	-16	-16
93	Supervisor Surveillance Grade I	4	5	1	-1	-2	-4	-4
94	Supervisor Surveillance Grade 2	24	12	-13	-13	-13	-16	-16
95	Communications Maintenance Technician (Senior)	35	32	-3	-7	-10	-15	-16
96	Communications Maintenance Technician (Junior)	36	34	-2	-3	-5	-10	-11
97	Communications Systems Technician (Senior)	15	7	-8	-8	-9	-9	-9
98	Communications Systems Technician (Junior)	21	15	-7	-7	-8	-8	-9
99	NavAids Maintenance Technician (Senior)	14	12	-2	-2	-5	-9	-9
100	NavAids Maintenance Technician (Junior)	21	19	-2	-3	-6	-12	-12
101	NavAids Systems Technician (Senior)	6	5	-1	-1	-1	-3	-3
102	NavAids Systems Technician (Junior)	12	2	-10	-10	-10	-10	-10
103	Radar Maintenance Technician (Senior)	21	18	-3	-4	-6	-8	-8
104	Radar Maintenance Technician (Junior)	27	19	-8	-8	-10	-13	-14
105	Radar Systems Technician (Senior)	15	8	-7	-7	-8	-8	-8
106	Radar Systems Technician (Junior)	15	9	-7	-7	-7	-8	-9
107	Radar Data Processor Technician (Senior)	9	6	-4	-4	-4	-5	-5
108	Radar Data Processor Technician (Junior)	27	16	-12	-12	-14	-17	-17
109	Miscellaneous Maintenance Technician (Junior)	0	5	5	5	5	2	2
110	Miscellaneous Maintenance Technician (Senior)	6	5	-1	-1	-1	-2	-2
111	Message Switch Technician (Senior)	18	14	-5	-5	-8	-9	-9
112	Message Switch Technician (Junior)	16	16	0	-1	-1	-2	-2
113	Message Switch Software Technician (Senior)	3	1	-2	-2	-2	-3	-3
114	Message Switch Software Technician (Junior)	27	3	-24	-24	-24	-24	-24
115	Electro-Mechanical Devices Technician (Senior)	6	24	18	17	15	12	12
116	Electro-Mechanical Devices Technician (Junior)	43	23	-20	-20	-21	-22	-22
117	Software Maintenance Technician (Senior)	6	2	-4	-4	-4	-4	-4
118	Software Maintenance Technician (Junior)	18	0	-18	-18	-18	-18	-18
119	Network Technician				0	-3	-2	-2
120	Systems Analyst				0	-1	-1	-1
121	Automation Specialist				0	-2	-1	-1
122	Project Management				0	0	-1	-1
123		499	339	-159	-176	-212	-260	-267
124								

Figure 20 (*Worksheet 7*), CNS Human Resource Difference Forecast – Year 1 to 5

7.1.2 Figure 20 (Worksheet.7) Human Resource Difference Forecast shows a sample of the summary of supply forecast for planning years 1 to 5. There are no user inputs to this worksheet all data is linked automatically from other worksheets as follows:

- Columns A and B (code and job category) linked from *Worksheet 1(WS-1 CNS Dbase).*
- Columns C (number of staff budgeted) linked from Worksheet 3A (WS-3A Audit).
- Column D (number of staff base year), linked from *Worksheet 4A (status year 1).*

- Column E (difference ± year 1), automatic calculation.
- Columns F, G, H and I linked from their respective columns in WS-5 Supply and WS-6 Demand. The differences for each year are automatically calculated and linked.

7.2 Human resource adjustments for one planning year

7.2.1 Figure 21 (*Worksheet 8*) identifies the status of the CNS Division human resources at the end of the base year (year 1). This worksheet also allows the user to increase or decrease staffing through inputs and outputs due to promotion and transfer into the division, recruitment of new staff and transfers out.

7.2.2 If re-deployment is necessary, this could cause changes that may require further re-deployment/recruitment (spill-down effect). A worksheet similar to *Worksheet 8* will need to be prepared for each year of the planning period.

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	C	D	E	F	G	H	I	J	K	L
4	WORKSHEET 8 - CNS DIVISION - PROMOTION/REDEPLOYMENT/RECRUITMENT - BASE YEAR (1)									
5										
6										
7	Job Category	Demand for Base Year	Supply at Start of Base Year	Promot. In	Transfer In	New Recruits	Transfer Out	Total Year 1	End of Base Year	Supply Start Year 2 Year
8	Supervisor Communications Grade I	4	4	1	0	0	0	1	1	5
9	Supervisor Communications Grade 2	21	16	1	1	0	0	2	-4	18
10	Supervisor Navigation Grade I	6	4	2	0	0	2	0	-2	4
11	Supervisor Navigation Grade 2	20	7	0	0	4	0	4	-9	11
12	Supervisor Surveillance Grade I	4	5	1	1	0	1	1	2	6
13	Supervisor Surveillance Grade 2	24	12	0	0	2	1	1	-12	13
14	Communications Maintenace Technician (Senior)	35	32	2	1	0	1	2	-1	34
15	Communications Maintenance Technician (Junior)	36	34	0	0	2	0	2	0	36
16	Communications Systems Technician (Senior)	15	7	1	0	0	0	1	-7	8
17	Communications Systems Technician (Junior)	21	15	0	0	2	0	2	-5	17
18	NavAids Maintenace Technician (Senior)	14	12	1	0	0	0	1	-1	13
19	NavAids Maintenace Technician (Junior)	21	19	0	0	0	0	0	-2	19
20	NavAids Systems Technician (Senior)	6	5	1	1	0	0	2	1	7
21	NavAids Systems Technician (Junior)	12	2	0	0	2	0	2	-8	4
22	Radar Maintenace Technician (Senior)	21	18	0	0	0	1	-1	-4	17
23	Radar Maintenace Technician (Junior)	27	19	0	0	0	0	0	-8	19
24	Radar Systems Technician (Senior)	15	8	0	0	0	1	-1	-8	7
25	Radar Systems Technician (Junior)	15	9	0	0	0	0	0	-7	9
26	Radar Data Processor Technician (Senior)	9	6	1	1	0	1	1	-3	7
27	Radar Data Processor Technician (Junior)	27	16	0	0	0	0	0	-12	16
28	Miscellaneous Maintenace Technician (Junior)	0	5	0	0	0	0	0	5	5
29	Miscellaneous Maintenace Technician (Senior)	6	5	0	0	0	0	0	-1	5
30	Message Switch Technician (Senior)	18	14	0	0	0	1	-1	-6	13
31	Message Switch Technician (Junior)	16	16	0	0	0	0	0	0	16
32	Message Switch Software Technician (Senior)	3	1	0	0	0	0	0	-2	1
33	Message Switch Software Technician (Junior)	27	3	0	0	0	0	0	-24	3
34	Electro-Mechanical Devices Technician (Senior)	6	24	0	0	0	0	0	18	24
35	Electro-Mechanical Devices Technician (Junior)	43	23	0	0	0	0	0	-20	23
36	Software Maintenance Technician (Senior)	6	2	0	0	0	0	0	-4	2
37	Software Maintenance Technician (Junior)	18	0	0	0	0	0	0	-18	0
38	Network Technician	0	0	0	0	2	0	2	2	2
39	Systems Analyst	0	0	0	0	0	0	0	0	0
40	Automation Specialist	0	0	0	0	0	0	0	0	0
41	Project Management	0	0	0	0	0	0	0	0	0
42	Totals	499	339	11	5	14	9	21	-138	360
43										

Figure 21 (Worksheet 8) Sample of Human Resource Promotion/Redeployment/Recruitment Status for Base Year

7.3 The training plan

7.3.1 Figure 22 (*Worksheet 9*) "*base year, including worksheet 8 input/outputs*". This provides a more accurate forecast for preparing a training plan. As stated in paragraph 1.5, a succession plan enables an organization to identify and prepare the right people for the right positions at the right time. The use of Figure 22 *(Worksheet 9*) is a useful tool to visualize succession planning.

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	B	C	D	E	F	G
4	WORKSHEET 9A - YEAR 1 INPUTS AND OUTPUTS					
5			Number Staff Budget	Supply	⇕	Supply End
6					WS-8	
7	Code	Job Category				
8			BASE YEAR (Y 1)			
9	SCG-1	Supervisor Communications Grade I	4	4	1	5
10	SCG-2	Supervisor Communications Grade 2	21	16	2	18
11	SNG-1	Supervisor Navigation Grade I	6	4	0	4
12	SNG-2	Supervisor Navigation Grade 2	20	7	4	11
13	SSG-1	Supervisor Surveillance Grade I	4	5	1	6
14	SSG-2	Supervisor Surveillance Grade 2	24	12	1	13
15	CMT-S	Communications Maintenace Technician (Seni	35	32	2	34
16	CMT-J	Communications Maintenance Technician (Jun	36	34	2	36
17	CST-S	Communications Systems Technician (Senior)	15	7	1	8
18	CST-J	Communications Systems Technician (Junior)	21	15	2	17
19	NAMT-S	NavAids Maintenace Technician (Senior)	14	12	1	13
20	NAMT-J	NavAids Maintenace Technician (Junior)	21	19	0	19
21	NAST-S	NavAids Systems Technician (Senior)	6	5	2	7
22	NAST-J	NavAids Systems Technician (Junior)	12	2	2	4
23	RMT-S	Radar Maintenace Technician (Senior)	21	18	-1	17
24	RMT-J	Radar Maintenace Technician (Junior)	27	19	0	19
25	RST-S	Radar Systems Technician (Senior)	15	8	-1	7
26	RST-J	Radar Systems Technician (Junior)	15	9	0	9
27	RDT-S	Radar Data Processor Technician (Senior)	9	6	1	7
28	RDT-J	Radar Data Processor Technician (Junior)	27	16	0	16
29	MMT-J	Miscellaneous Maintenace Technician (Junior)	0	5	0	5
30	MMT-S	Miscellaneous Maintenace Technician (Senior)	6	5	0	5
31	MST-S	Message Switch Technician (Senior)	18	14	-1	13
32	MST-J	Message Switch Technician (Junior)	16	16	0	16
33	MSDT-S	Message Switch Software Technician (Senior)	3	1	0	1
34	MSDT-J	Message Switch Software Technician (Junior)	27	3	0	3
35	EMDT-S	Electro-Mechanical Devices Technician (Senior	6	24	0	24
36	EMDT-J	Electro-Mechanical Devices Technician (Junior	43	23	0	23
37	SWMT-S	Software Maintenance Technician (Senior)	6	2	0	2
38	SWMT-J	Software Maintenance Technician (Junior)	18	0	0	0
39	New-1	Network Technician	0			0
40	New-2	Systems Analyst	0			0

Figure 22 (Worksheet 9) Status of base year including worksheet 8 input/outputs

7.4 Planning projection tool

7.4.1 A worksheet 9 and Worksheet 8 can be used in conjunction with each other to provide a tool to indicate the effect on the future years (planning period) due to human resource inputs and outputs of the organization. The flow chart in Figures 23 illustrates the process.

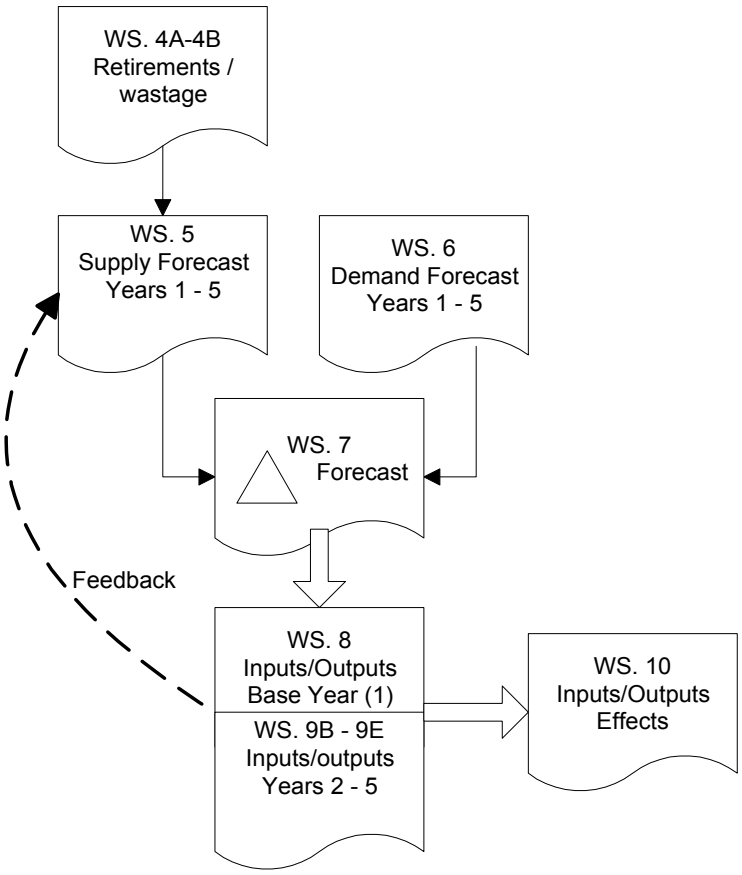
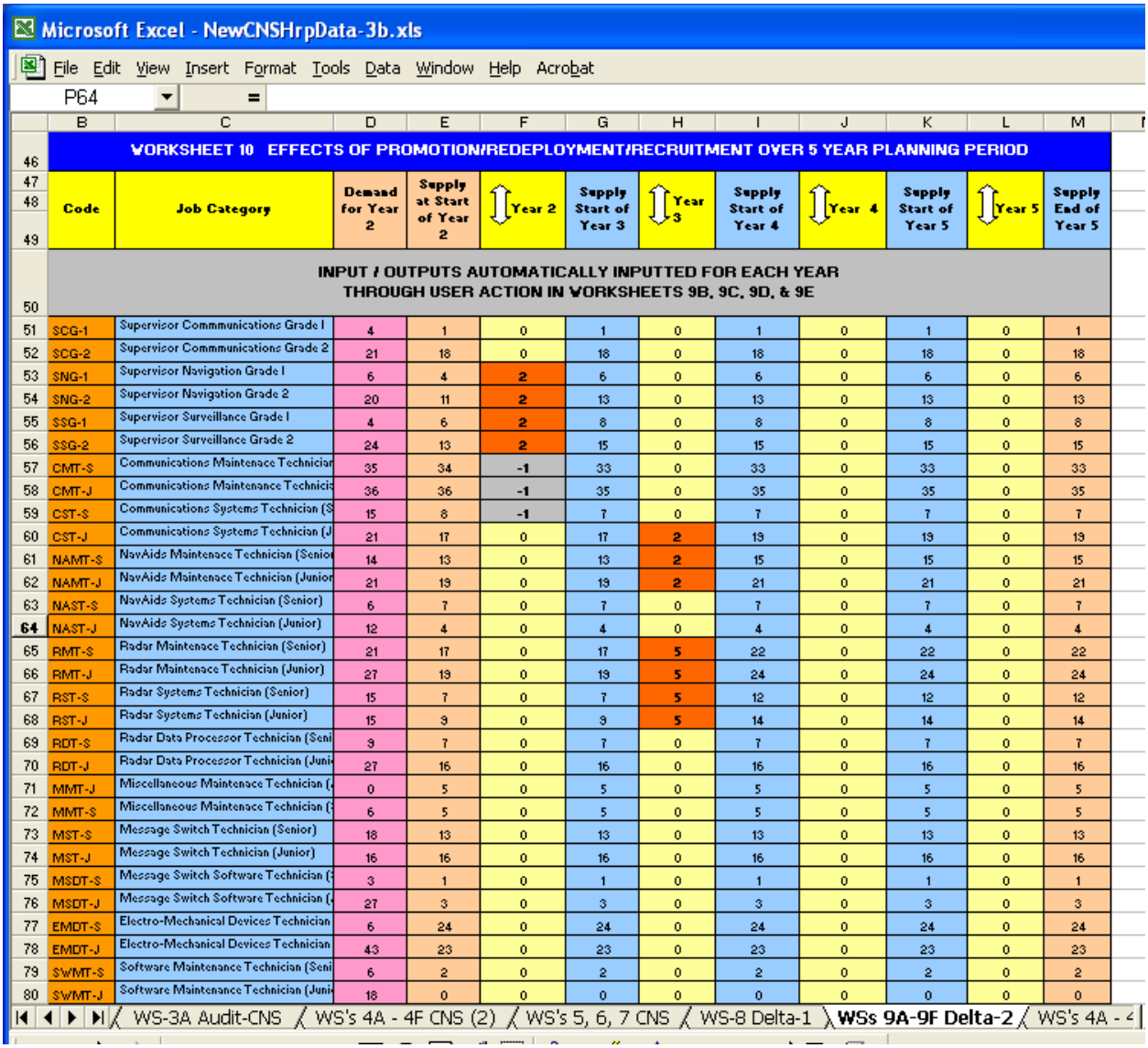


Figure 23 Flow chart for identifying effects of staff changes over the planning period

7.4.2 Figure 24 (*Worksheet 10*) "*Effects of promotion/recruitment/redeployment over 5 years*" is a sample worksheet that provides what effect the changes (inputs and outputs) in the base year and subsequent years have on each of the planning years. Note, from Figure 22, any changes made in one year will feedback to the supply forecast worksheets (Worksheet 5) and in turn, affect the results in worksheet 10 (figure 24).



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WORKSHEET 10 EFFECTS OF PROMOTION/REDEPLOYMENT/RECRUITMENT OVER 5 YEAR PLANNING PERIOD

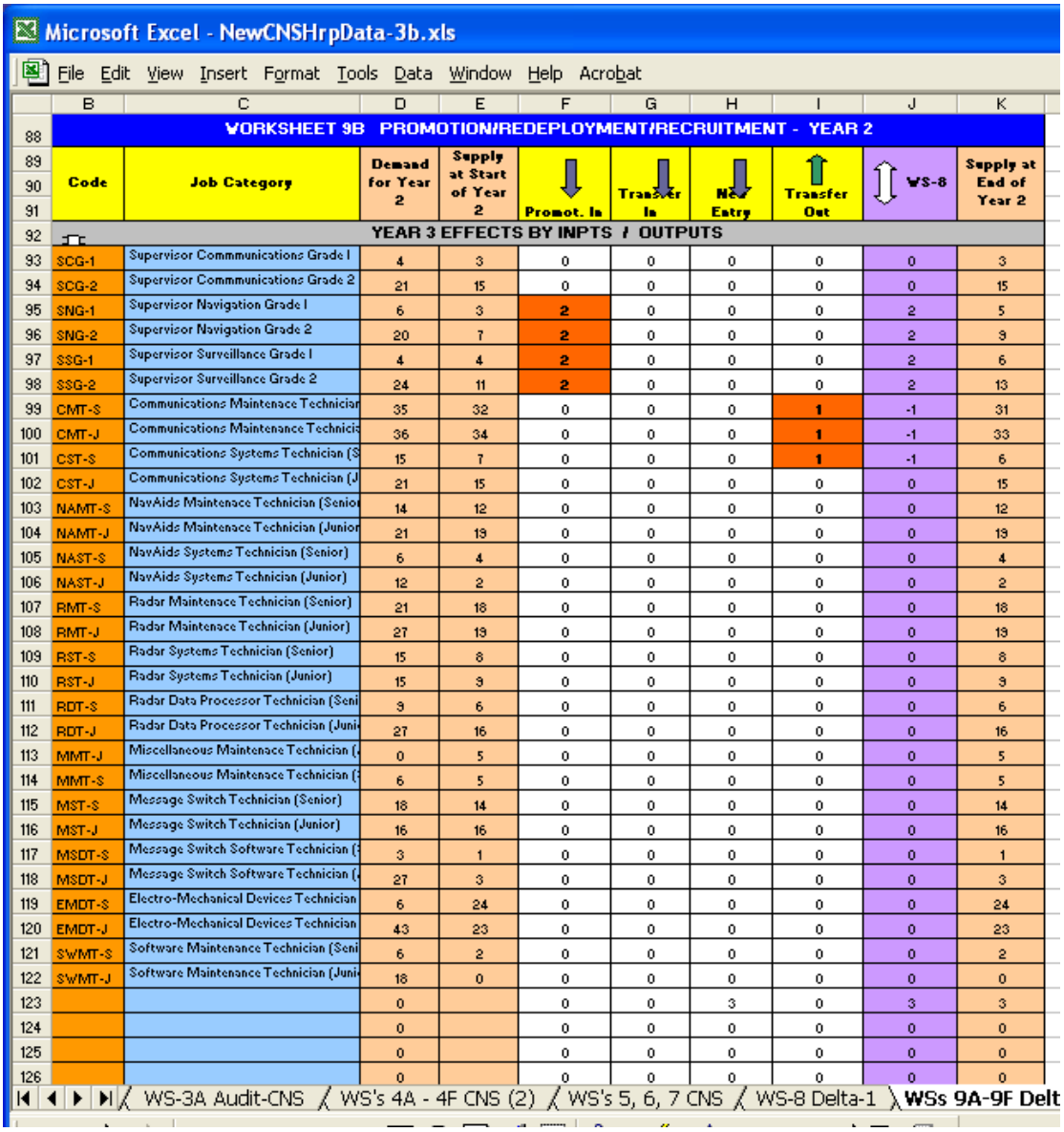
Code	Job Category	Demand for Year 2	Supply at Start of Year 2	Year 2	Supply Start of Year 3	Year 3	Supply Start of Year 4	Year 4	Supply Start of Year 5	Year 5	Supply End of Year 5
	INPUT / OUTPUTS AUTOMATICALLY INPUTTED FOR EACH YEAR THROUGH USER ACTION IN WORKSHEETS 9B, 9C, 9D, & 9E										
SCG-1	Supervisor Commmunications Grade I	4	1	0	1	0	1	0	1	0	1
SCG-2	Supervisor Commmunications Grade 2	21	18	0	18	0	18	0	18	0	18
SNG-1	Supervisor Navigation Grade I	6	4	2	6	0	6	0	6	0	6
SNG-2	Supervisor Navigation Grade 2	20	11	2	13	0	13	0	13	0	13
SSG-1	Supervisor Surveillance Grade I	4	6	2	8	0	8	0	8	0	8
SSG-2	Supervisor Surveillance Grade 2	24	13	2	15	0	15	0	15	0	15
CMT-S	Communications Maintenace Technician	35	34	-1	33	0	33	0	33	0	33
CMT-J	Communications Maintenance Technici	36	36	-1	35	0	35	0	35	0	35
CST-S	Communications Systems Technician (S	15	8	-1	7	0	7	0	7	0	7
CST-J	Communications Systems Technician (J	21	17	0	17	2	19	0	19	0	19
NAMT-S	NavAids Maintenace Technician (Senio	14	13	0	13	2	15	0	15	0	15
NAMT-J	NavAids Maintenace Technician (Junior	21	19	0	19	2	21	0	21	0	21
NAST-S	NavAids Systems Technician (Senior)	6	7	0	7	0	7	0	7	0	7
NAST-J	NavAids Systems Technician (Junior)	12	4	0	4	0	4	0	4	0	4
RMT-S	Radar Maintenace Technician (Senior)	21	17	0	17	5	22	0	22	0	22
RMT-J	Radar Maintenace Technician (Junior)	27	19	0	19	5	24	0	24	0	24
RST-S	Radar Systems Technician (Senior)	15	7	0	7	5	12	0	12	0	12
RST-J	Radar Systems Technician (Junior)	15	9	0	9	5	14	0	14	0	14
RDT-S	Radar Data Processor Technician (Seni	9	7	0	7	0	7	0	7	0	7
RDT-J	Radar Data Processor Technician (Juni	27	16	0	16	0	16	0	16	0	16
MMT-J	Miscellaneous Maintenace Technician (	0	5	0	5	0	5	0	5	0	5
MMT-S	Miscellaneous Maintenace Technician (	6	5	0	5	0	5	0	5	0	5
MST-S	Message Switch Technician (Senior)	18	13	0	13	0	13	0	13	0	13
MST-J	Message Switch Technician (Junior)	16	16	0	16	0	16	0	16	0	16
MSDT-S	Message Switch Software Technician (	3	1	0	1	0	1	0	1	0	1
MSDT-J	Message Switch Software Technician (	27	3	0	3	0	3	0	3	0	3
EMDT-S	Electro-Mechanical Devices Technician	6	24	0	24	0	24	0	24	0	24
EMDT-J	Electro-Mechanical Devices Technician	43	23	0	23	0	23	0	23	0	23
SWMT-S	Software Maintenance Technician (Seni	6	2	0	2	0	2	0	2	0	2
SWMT-J	Software Maintenance Technician (Juni	18	0	0	0	0	0	0	0	0	0

WS-3A Audit-CNS | WS's 4A - 4F CNS (2) | WS's 5, 6, 7 CNS | WS-8 Delta-1 | **WSs 9A-9F Delta-2** | WS's 4A -

Figure 24 (Worksheet 10) Indication of effects on years 2 – 5 by changes in any year

7.4.3 Worksheet 10 (Figure 24) is the result of entering appropriate input/output data regarding promotions/redeployment/recruitment in four worksheets (Worksheets (9B, 9C, 9D and 9E), one each for planning years 2, 3, 4 and 5. The outputs of each of these worksheets are linked to worksheet 10. The resulting effect of worksheet 10 is to provide a forecast of the status of human resources at the end (or beginning) of each planning year. The worksheets also enable the user to conduct a "what-if" scenario for any portion of the planning period.

7.4.4 Figure 25 shows a sample of Worksheet 9B, Figure 25, indicating user inputs for, promotion, redeployment, transfer-in and transfer-out. Worksheets 9C, 9D and 9E (for planning years 3, 4 and 5) are the same.



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	B	C	D	E	F	G	H	I	J	K
88	WORKSHEET 9B PROMOTION/REDEPLOYMENT/RECRUITMENT - YEAR 2									
89	Code	Job Category	Demand for Year 2	Supply at Start of Year 2	Promot. In	Transfer In	New Entry	Transfer Out	WS-8	Supply at End of Year 2
90										
91										
92	YEAR 3 EFFECTS BY INPTS / OUTPUTS									
93	SCG-1	Supervisor Communications Grade I	4	3	0	0	0	0	0	3
94	SCG-2	Supervisor Communications Grade 2	21	15	0	0	0	0	0	15
95	SNG-1	Supervisor Navigation Grade I	6	3	2	0	0	0	2	5
96	SNG-2	Supervisor Navigation Grade 2	20	7	2	0	0	0	2	9
97	SSG-1	Supervisor Surveillance Grade I	4	4	2	0	0	0	2	6
98	SSG-2	Supervisor Surveillance Grade 2	24	11	2	0	0	0	2	13
99	CMT-S	Communications Maintenace Technician	35	32	0	0	0	1	-1	31
100	CMT-J	Communications Maintenance Technici	36	34	0	0	0	1	-1	33
101	CST-S	Communications Systems Technician (S	15	7	0	0	0	1	-1	6
102	CST-J	Communications Systems Technician (J	21	15	0	0	0	0	0	15
103	NAMT-S	NavAids Maintenace Technician (Senio	14	12	0	0	0	0	0	12
104	NAMT-J	NavAids Maintenace Technician (Junior	21	19	0	0	0	0	0	19
105	NAST-S	NavAids Systems Technician (Senior)	6	4	0	0	0	0	0	4
106	NAST-J	NavAids Systems Technician (Junior)	12	2	0	0	0	0	0	2
107	RMT-S	Radar Maintenace Technician (Senior)	21	18	0	0	0	0	0	18
108	RMT-J	Radar Maintenace Technician (Junior)	27	19	0	0	0	0	0	19
109	RST-S	Radar Systems Technician (Senior)	15	8	0	0	0	0	0	8
110	RST-J	Radar Systems Technician (Junior)	15	9	0	0	0	0	0	9
111	RDT-S	Radar Data Processor Technician (Seni	9	6	0	0	0	0	0	6
112	RDT-J	Radar Data Processor Technician (Juni	27	16	0	0	0	0	0	16
113	MMT-J	Miscellaneous Maintenace Technician (	0	5	0	0	0	0	0	5
114	MMT-S	Miscellaneous Maintenace Technician (	6	5	0	0	0	0	0	5
115	MST-S	Message Switch Technician (Senior)	18	14	0	0	0	0	0	14
116	MST-J	Message Switch Technician (Junior)	16	16	0	0	0	0	0	16
117	MSDT-S	Message Switch Software Technician (	3	1	0	0	0	0	0	1
118	MSDT-J	Message Switch Software Technician (	27	3	0	0	0	0	0	3
119	EMDT-S	Electro-Mechanical Devices Technician	6	24	0	0	0	0	0	24
120	EMDT-J	Electro-Mechanical Devices Technician	43	23	0	0	0	0	0	23
121	SWMT-S	Software Maintenance Technician (Seni	6	2	0	0	0	0	0	2
122	SWMT-J	Software Maintenance Technician (Juni	18	0	0	0	0	0	0	0
123			0		0	0	3	0	3	3
124			0		0	0	0	0	0	0
125			0		0	0	0	0	0	0
126			0		0	0	0	0	0	0

WS-3A Audit-CNS / WS's 4A - 4F CNS (2) / WS's 5, 6, 7 CNS / WS-8 Delta-1 \ WSs 9A-9F Delt

Figure 25 (Worksheet 9B) Sample of year 2, promotion, redeployment, transfer-in and transfer-out