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DATA CALL SUPPLEMENT
FOR
JOINT CROSS SERVICE GROUP - DEPOT MAINTENANCE

Naval Surface Warfare Center Crane Division Crane, Indiana Site
UIC: N00164

CAPACITY

1. Capacity Utilization

1.1 Calculate the capacity index for the commodity groups applicable to depot maintenance work at your activity. Provide your answers expressed in direct labor hours (DLHs) in Table 1.1.a by commodity groups for the Fiscal Years requested.

Table 1.1.a: **Capacity Index**

COMMODITY GROUP	INDEX (DLHs)					
	FY 1995	FY 1996	FY 1997	FY 1998	FY 1999	
2.g	261,960	273,563	279,234	280,768	282,302	
4.a	22,193	22,193	22,193	22,193	22,193	
4.b	37,800	37,800	37,800R	37,800	37,800	R
7.e	2,196	11,333	21,815	29,310	29,327	
7.f	58,000	86,000	92,000	121,000	156,000	
11.a	16,998	16,998	16,998	16,998	16,998	
11.b	342,932	397,827	410,137	415,309	423,948	
14	4,432	4,564	4,701	4,842	4,988	
TOTAL	746,511	850,278	884,878R	928,220	973,556	R

rev.

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7.e	2,196	11,333	21,815	29,310	29,327
7.f	58,000	86,000	92,000	121,000	156,000
11.a	16,998	16,998	16,998	16,998	16,998
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4.b	37,800	37,800	37,500	37,800	37,800
7.e	2,196	11,333	21,815	29,310	29,327
7.f	58,000	86,000	92,000	121,000	156,000
11.a	16,998	16,998	16,998	16,998	16,998
11.b	342,932	397,827	410,137	415,309	423,948
14	4,432	4,564	4,701	4,842	4,988
TOTAL	748,506	852,274	886,575	930,218	975,555

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1. Capacity Utilization, continued

1.2 Calculate the utilization index for the commodity groups applicable to depot maintenance work at your activity. Provide your answers expressed as a percentage (%) in Table 1.2.a by commodity groups for the Fiscal Years requested.

Table 1.2.a: **Utilization Index**

COMMODITY GROUP	INDEX (%)					
	FY 1995	FY 1996	FY 1997	FY 1998	FY 1999	
2.g	107.1%	90.6%	89.5%	88.4%	88.2%	R
4.a	0	0	0	0	0	
4.b	100%	100%	100%	100%	100%	
7.e	83.93%	16.28%	20.83%	22.67%	21.65%	
7.f	71.5%	100%	100%	89.1%	92.3%	R
11.a	98.48%	99.07%	99.07%	57.65%	57.65%	
11.b	107.6%	96.3%	93.9%	89.4%	91.8%	R
14	56.40%	54.77%	89.34%	86.74%	84.20%	
TOTAL	101.7%	91.3%	89.3%	84.6%	86.2%	R

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1. Capacity Utilization, continued

1.2 Calculate the utilization index for the commodity groups applicable to depot maintenance work at your activity. Provide your answers expressed as a percentage (%) in Table 1.2.a by commodity groups for the Fiscal Years requested.

Table 1.2.a: **Utilization Index**

COMMODITY GROUP	INDEX (%)				
	FY 1995	FY 1996	FY 1997	FY 1998	FY 1999
2.g	62.5%	54.1%	53.3%	53.2%	52.8%
4.a	0	0	0	0	0
4.b	100%	100%	100%	100%	100%
7.e	83.93%	16.28%	20.83%	22.67%	21.65%
7.f	72.0%	81.0%	83.0%	88.0%	92.0%
11.a	98.48%	99.07%	99.07%	57.65%	57.65%
11.b	85.49%	89.76%	71.68%	81.5%	76.19%
14	56.40%	54.77%	89.34%	86.74%	84.20%
TOTAL	74.85%	72.9%	65.7%	69.2%	68.2%

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1. **Capacity Utilization, continued**

1.2 Calculate the utilization index for the commodity groups applicable to depot maintenance work at your activity. Provide your answers expressed as a percentage (%) in Table 1.2.a by commodity groups for the Fiscal Years requested.

Table 1.2.a: **Utilization Index**

COMMODITY GROUP	INDEX (%)				
	FY 1995	FY 1996	FY 1997	FY 1998	FY 1999
2.g	62.5%	54.1%	53.3%	53.2%	52.8%
4.a	0	0	0	0	0
4.b	100%	100%	100%	100%	100%
7.e	83.93%	16.28%	20.83%	22.67%	21.65%
7.f	72.0%	81.0%	83.0%	88.0%	92.0%
11.a	98.48%	99.07%	99.07%	57.65%	57.65%
11.b	85.49%	89.76%	71.68%	81.5%	76.19%
14	56.40%	54.77%	89.34%	86.74%	84.20%
TOTAL	564.8%	494.98%	517.22%	489.76%	484.49%

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1. Capacity Utilization, continued

1.3 Assuming (a) the current projected total workload remains as assigned; (b) that sufficient production demand is available to justify maximum hiring, with no significant investment in capital equipment; and (c) no major Military Construction additional to that already approved and funded: what is the maximum extent to which operations, by commodity group, could be expanded for depot maintenance work at your activity, based on the current and future planned workload mixes? Please provide your response in the absolute maximum number of direct labor hours (DLHs).

Table 1.3.a: **Maximum Potential Capacity**

COMMODITY GROUP	INDEX (DLHs)					
	FY 1995	FY 1996	FY 1997	FY 1998	FY 1999	
2.g	376,918	409,918	409,918	421,918	426,987	
4.a	24,140	25,347	26,615	27,946	29,343	
4.b	76,000	76,000	76,000	76,000	76,000	R
7.e	17,217	53,220	63,702	71,197	71,214	
7.f	71,000	98,000	637,000	637,000	637,000	
11.a	17,264	31,392	31,392	31,392	31,392	
11.b	1,019,316	1,112,356	1,127,234	1,142,857	1,168,261	
14	8,864	9,307	9,772	10,261	10,774	
TOTAL	1,610,719	1,815,540	2,381,633	2,418,571	2,450,971	R

1. Capacity Utilization, continued

1.3 Assuming (a) the current projected total workload remains as assigned; (b) that sufficient production demand is available to justify maximum hiring, with no significant investment in capital equipment; and (c) no major Military Construction additional to that already approved and funded: what is the maximum extent to which operations, by commodity group, could be expanded for depot maintenance work at your activity, based on the current and future planned workload mixes? Please provide your response in the absolute maximum number of direct labor hours (DLHs).

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	FY 1995	FY 1996	FY 1997	FY 1998	FY 1999
2.g	376,918	409,918	409,918	421,918	426,980
4.a	24,140	25,347	26,615	27,946	29,343
4.b	78,000	78,000	78,000	78,000	78,000
7.e	17,217	53,220	63,702	71,197	71,214
7.f	71,000	98,000	637,000	637,000	637,000
11.a	17,264	31,392	31,392	31,392	31,392
11.b	1,019,316	1,112,356	1,127,234	1,142,857	1,168,261
14	8,864	9,307	9,772	10,261	10,774
TOTAL	1,612,719	1,817,540	2,383,633	2,420,571	2,452,964

MAXIMUM POTENTIAL CAPACITY

Commodity Group 2.g:

Microwave Tubes

Maximum Potential Depot/Industrial Workload was calculated based on existing available space and additional space resulting from an already programmed MILCON. Pesonnel were not considered a constraint. Work positions were not considered a constraint but the equipment making up these work positions consist of numerous long lead items thus affecting the number of work positions available in each year. Maximum Potential Capacity was calculated in accordance with the Defense Depot Maintenance Council approved update to DoD 4151.15H dated December 5, 1990.

Maximum Potential Capacity = 1 + (1 - UI)) x Predicted Workload for each fiscal year.

Electronic Warfare

Data for units developed by each depot personnel utilizing their expertise. Data provided didn't include all hours, only technician/bench hours. A formula was developed based on FY-93 actual technician hour data and FY-93 actual depot labor expended. For each technician hour there are several other supporting personnel hours. Doubling workload does not result in all supporting hours doubling. A multiplication factor was established, based on historical data, to account for support hour growth with respect to workload growth. Utilized formula and Maximum Potential technician hours data provided to calculate maximum throughput.

Assumed current spaces (constraint), high percentage of utilization of work positions and receiving new TTS, ETS, RADCOM, use of CASS, ASPJ testers(4), build specific ATE to improve efficiencies.

Commodity Group 11.b:

Microwave Tubes

Maximum Potential Depot/Industrial Workload was calculated based on existing available space and additional space resulting from an already programmed MILCON. Pesonnel were not considered a constraint. Work positions were not considered a constraint but the equipment making up these work positions consist of numerous long lead items thus affecting the number of work positions available in each year. Maximum Potential Capacity was calculated in accordance with the Defense Depot Maintenance Council approved update to DoD 4151.15H dated December 5, 1990.

Maximum Potential Capacity = 1 + (1 - UI)) x Predicted Workload for each fiscal year.

Electronic Warfare

A MILCON (Bldg 3251) is in progress at NSWCCD to house Ship Self Defense Electronic Warfare Systems (EWS) (AN/SLQ-32(V), AN/SLA-10, AN/ULM-4, AN/WLR-1H, AN/SSQ-82, AN/ULQ-13, AN/SSQ-95 and MK-53). The contract completion date is September 1995, however, construction is three months ahead of schedule. This facility will provide 72,000 square feet to support Design Agent, In-Service Engineering Agent, Acquisition Engineering Agent, Depot, Technical Direction Agent, Software Support Agent and Tactical System Support Center assignments for EWSs.

Bldg 3251 provides the space to allow system repairs, overhauls and restorations to proceed through depot processes in a very cost effective and efficient manner. The government has procured twelve AN/SLQ-32(V) unique test stations with associated software, engineering papers and special tooling, with delivery scheduled to begin in May 1994. The receipt of this specialized equipment will increase the depot capacity and provides NSWCCD with full System unit level test capability. Bldg 3251 will house six AN/SLQ-32(V) test beds for Navy system and module depot efforts while the existing Systems Lab, at Bldg 41, will provide space for Foreign Military Sales system overhauls and Navy Training workload. Bldg 3224 will house Other EW workload.

NSWCCD does not require any additional major equipment beyond that described above.

Production rates will depend on the amount of personnel tasked to test, repair, overhaul, upgrade and restore complete Systems, Shipboard Replaceable Units and Shipboard Replaceable Assemblies. Throughput and capability to perform system (Restorations and Comprehensive Repair, Align and Calibrate) and lower level work will increase upon the receipt of the test equipment. NSWCCD is involved in a public/private teaming effort to perform AN/SLQ-32(V) Restorations due to the cessation of production by the Original Equipment Manufacturer. NSWCCD is unique in that it is the only activity (DOD and commercial) that is certified to perform Comprehensive Repair, Align and Calibrate to support the Fleet.

Upon receipt of the test equipment there will not be any workload constraints.

Radar

Current planned MILCONS will free up additional floor space within Bldg. 41N to allow expansion of radar work. In FY 95, we were able to add an additional 9,840 sq. ft. for LRU production due to MILCON P-242. In FY 96 we gained 2,080 sq. ft. total (2200 for LRUs and 880 for overhauls)due to MILCON P-266. In FY 97 we gained 2,000 sq. ft. for overhauls due to MILCON P-262.

For the LRU and overhaul areas, we calculated production rates (units per sq. ft.) using today's actual production numbers and existing test stations available. We then did a straight multiplication of units/sq. ft. times the space that would be available in that year to obtain total maximum throughput.

202 Revised pg

We assumed equipment would be made available to support the increased production rates relative to the space available. The number of work stations over what now exists was increased as follows:

FY94	FY95	FY96	FY97	FY98	FY99	FY00	FY01
54	57	65	75	75	78	78	78

Commodity Group 7.f:

Additional space utilized:

FY95	add 2400 sq ft (module 4)
FY96	add 2400 sq ft (module 1)
	add 2800 sq ft (bldg 41)
FY97	add 52237 sq ft MILCON (maintenance space)

Major equipment required: No major equipment is currently planned to be procured. (major defined as greater than $300K in cost)

Production rates: Based on historical data our average production rate is 6.61 hours per item. (244 units per work year)

Constraints: Prior to FY97 floor space is a constraining factor.

CAPACITY

2. Plant Replacement Value

2.1 What is the estimated Plant Replacement Value (PRV) as of the end of each Fiscal Year of your depot maintenance activity expressed in thousands of dollars ($K) as a function of the facilities and equipment? Provide your answer in Table 2.1.

Table 2.1: **Expenditures and Equipment Values**

PRV	**$ K**					
	FY 1995	**FY 1996**	**FY 1997**	**FY 1998**	**FY 1999**	
Facilities	104,235	108,604	112,948	117,570	122,273	R
Equipments	249,921	264,681	275,977	286,524	293,027	R
TOTAL	354,156	373,285	388,925	404,094	415,300	R

We assumed equipment would be made available to support the increased production rates relative to the space available. The number of work stations over what now exists was increased as follows:

FY94	FY95	FY96	FY97	FY98	FY99	FY00	FY01
54	57	65	75	75	78	78	78

Commodity Group 7.f:

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2. Plant Replacement Value

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Table 2.1: **Expenditures and Equipment Values**

PRV	$ K				
	FY 1995	FY 1996	FY 1997	FY 1998	FY 1999
Facilities	54,295	55,921	57,908	59,450	61,098
Equipments	249,321	264,081	275,277	285,824	292,327
TOTAL	305,611	321,998	335,182	347,272	355,424

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CAPACITY

3. Programmed Workload

3.1 Given the current configuration and operation of your activity, provide the programmed depot level workload by commodity group in Tables 3.1.a and 3.1.b. Express your answer in both dollars ($K) and direct labor hours (DLH) for the Fiscal Years requested.

Table 3.1.a: **Programmed Workload**

COMMODITY GROUP	$ K					
	FY 1995	FY 1996	FY 1997	FY 1998	FY 1999	
2.g	12,881	11,780	12,176	12,460	12,818	R
4.a	0	0	0	0	0	
4.b	1,924	2,040	2,162	2,292	2,429	R
7.e	92	92	212	332	317	
7.f	1,894	3,936	4,401	5,321	7,288	R
11.a	837	843	793	494	469	
11.b	17,833	18,769	19,401	19,099	20,562	R
14	125	128	223	229	236	
TOTAL	35,586	37,588	39,368	40,227	44,119	R

Table 3.1.b: **Programmed Workload**

COMMODITY GROUP	DLHs					
	FY 1995	FY 1996	FY 1997	FY 1998	FY 1999	
2.g	280,601	248,097	249,856	248,289	247,988	R
4.a	0	0	0	0	0	
4.b	37,800	37,800	37,800	37,800	37,800	R
7.e	1,843	1,845	4,245	6,645	6,346	
7.f	41,491	86,000	92,000	107,800	144,000	R
11.a	16,741	16,840	16,840	9,800	9,800	
11.b	369,061	383,447	385,050	371,097	389,063	R
14	2,500	2,500	4,200	4,200	4,200	
TOTAL	750,037	776,529	789,991	785,631	839,197	R

CAPACITY

3. Programmed Workload

3.1 Given the current configuration and operation of your activity, provide the programmed depot level workload by commodity group in Tables 3.1.a and 3.1.b. Express your answer in both dollars ($K) and direct labor hours (DLH) for the Fiscal Years requested.

Table 3.1.a: **Programmed Workload**

COMMODITY GROUP	$ K				
	FY 1995	FY 1996	FY 1997	FY 1998	FY 1999
2.g	12,237	11,071	11,492	11,757	12,095
4.a	0	0	0	0	0
4.b	1,924	2,040	2,162	2,292	2,429
7.e	92	92	212	332	317
7.f	1,894	3,204	3,636	5,272	7,308
11.a	837	843	793	494	469
11.b	16,045	17,495	17,184	17,401	17,074
14	125	128	223	229	236
TOTAL	33,154	34,873	35,702	37,777	39,928

Table 3.1.b: **Programmed Workload**

COMMODITY GROUP	DLHs				
	FY 1995	FY 1996	FY 1997	FY 1998	FY 1999
2.g	266,601	234,097	235,856	234,289	233,988
4.a	0	0	0	0	0
4.b	38,000	38,000	38,000	38,000	38,000
7.e	1,843	1,845	4,245	6,645	6,346
7.f	41,491	70,039	76,597	106,943	144,395
11.a	16,741	16,840	16,840	9,800	9,800
11.b	332,371	357,122	341,097	338,818	323,014
14	2,500	2,500	4,200	4,200	4,200
TOTAL	699,547	720,443	716,835	738,695	759,743

CAPACITY

4. Service Centers of Excellence

4.1 If your activity has been designated as a Service Center of Excellence for any of the commodity groups, please identify them below.

NAVAL SURFACE WARFARE CENTER, CRANE DIVISION
DEPOT MAINTENANCE CENTER OF TECHNICAL EXCELLENCE (CTX)

A. The Naval Surface Warfare Center, Crane Division, Crane Site identifies three (3) CTX capabilities:

- MICROWAVE SYSTEMS
- ELECTRONIC MODULE TEST AND REPAIR
- ACOUSTIC SENSORS

2. CRANE SITE

a. CTX name/identification - MICROWAVE SYSTEMS

Commodity/technology/process/system supported

Systems and components used for generation, transmission, reception and processing of microwave energy and associated data

Brief narrative - Microwave system depot functions are co-located with the engineering agent responsibilities for fielded systems. This dual use of resources provides a more effective utilization of a wide range of skills, facilities and equipment. Depot functions are performed from the system level down to the component level. The specific technologies contained within this CTX span a wide range such as digital, vacuum rf/microwave, solid state rf/microwave, analog, microwave antennas, laser and electro-optics.

b. CTX name/identification - ACOUSTIC SENSORS

Commodity/technology/process/system supported

Navigation
AN/BQN3 TR143 Transducers
Mine Warfare
AN/BQS15 TR282 Transducer Windows
Acoustic Test System
WQM6 Sonar Acoustic Target Sources

Brief Narrative - The Acoustic Sensors Test complex located at the Crane Site provides the full spectrum of hydroacoustic facilities coupled with industrial equipment, failure analysis, environmental test laboratories, and repair operations required to support the complete life cycle of Fleet systems. This full spectrum capability has resulted in the evolution of acoustic devices from high cost, hard-to-produce items to low cost, competitively procured, easily producible items. Expertise and facilities support product and reverse engineering, prototyping, emergency production, repair, test, evaluation, and technology insertion for acoustic devices and systems.

c. CTX name/identification - ELECTRONIC MODULE TEST AND REPAIR

Commodity/technology/process/system supported

Fire Control
- MK86 Gun Fire Control System modules
- Precision Rotating Components

Mine Warefare
- AN/SQQ14 Mine Classifying/Detecting Set
- AN/SQQ30 Mine Classifying/Detecting Set

Anti submarine Warfare
- AN/SQQ89 Surface Anti Submarine Warfare modules

Navigation
- AN/SSN2 Precise Integrated Navigation System
- Precision Rotating Components

Computers
- AN/UYK7 Navy Standard Computer
- AN/UYK44 Navy Standard Computer

Combat Control
- AN/BSY1 Combat Control/Acoustic Set modules

Communication
- National Security Agency Signal Intelligence Systems modules

ATE & TPS development software
- Fleet Module Screen and Repair Activities
- Navy Progressive Repair Program

BRIEF NARRATIVE - Crane Division has World Class capability for the engineering and technical disciplines which support test and repair of electronic assemblies/subassemblies including digital and analog circuit card assemblies, power supplies, microwave modules, standard electronic modules, cameras and monitors, computers, and precision rotating components. Inherently governmental functions include independent verification of the operational requirements of electronic assemblies/subassemblies; certification of test and repair processes and procedures; and advising program offices in the specification and selection of appropriate test/repair equipment, tools, and processes (Smart Buyer function). Crane Division is the Navy focal point for introduction of Progressive Maintenance capabilities into the Fleet. Progressive Maintenance capitalizes on the vast array of Crane Division engineering and logistic experience in repair processes and module tests/diagnostics.

DATA CALL SUPPLEMENT
FOR
JOINT CROSS SERVICE GROUP - DEPOT MAINTENANCE

MEASURES OF MERIT

Geographic

1. Location

1.1 Specify any special strategic importance or military value consideration of your activity accruing from its geographical location.

Activity Location Description of Strategic Importance/Military Value

REMOTE LOCATION - Crane Division is set in the rolling hills of southwestern Indiana. Although it is conveniently located with respect to major urban areas, with good access to rail, highway, and air transportation, Crane Division offers a virtually crime-free rural setting with numerous opportunities for outdoor recreation. **The cost of living in southern Indiana is among the lowest in the nation.** Not coincidentally, many Navy military people remain in the Crane area after retirement for just these reasons.

With nearly **100 square miles** inside its boundaries, Crane has the space to locate several unique facilities within a single organization with **significant unused area remaining for growth.**

Environmental Compliance - From an environmental standpoint, the geographic location of this facility is key to its successful operation and the continuation of missions which other facilities are being forced to close. Crane Division is remote, with little encroachment from residential or private industry. **The facility occupies land which, due to the topography and soil types, is of little value for farming, residential development, or private industry.**

EPA Region V and the Indiana Department of Environmental Management work well with the people and operations at Crane. Furthermore, the communities surrounding the Division are extremely supportive of the facility and its programs. **In other words, there is almost no antagonistic opposition from the public or regulators to environmental permits and related activities.** This favorable relationship is extraordinary among Department of Defense facilities.

Crane Division is also located in an attainment area for criteria pollutants under paragraph 107 of the Clean Air Act. **The nearly 64,000 acres which the base occupies provide an excellent natural laboratory in which to conduct studies to determine and monitor the impacts and risks to the environment associated with mission activities.** A considerable amount of money has been spent doing environmental assessment and installing monitoring equipment (e.g. over 400 groundwater monitoring wells). All of this combines to allow a wide diversity of operations rarely available anywhere else. **The location of Crane Division ideally situates it for different types of test, demolition, and firing ranges, as well as manufacturing and munitions storage.**

Mission Execution - With a superficial review, Crane Division's midwestern location may be seen as a disadvantage to the Navy, simply because the Navy equates to coastal properties. However, **providing the Navy with superior electronic and mechanical products, must by no means be a coastal activity.** In fact, many features of unique remote site product testing, readiness, logistics supply, and retention of skilled personnel are enhanced by the mid-continent location.

Small Arms - Removal from high density population centers allows for the testing of small arms weapons, mounts and ammunition without restrictions based on noise pollution requirements. Also, **this location reduces security risks due to infiltration or threat of urban uprising.** The salt-free environment lowers maintenance costs, and there is decreased likelihood of environmental catastrophes (hurricanes, earthquakes, floods and large scale fires).

Radiation - This remote geographic location, with its low population density, has reduced FCC requirements and regulations. **As an ordnance storage and control facility, radio frequency radiators are controlled by the station, enabling testing that requires low background noise (large acreage and remote rural area with no large commercial radiators).** A restricted fly zone provides the free space high power microwave radiation requires and allows work to be performed in a "Blue Sky" environment. The valley location, surrounded by large indeciduous trees, minimizes outside interference. Large available acreage allows adaptability for all DoD antenna range requirements. The site also provides the quiet environment required for hydroacoustic measurements.

Night Vision - An additional advantage of the rural location of this facility is the ability to test and evaluate Night Vision and Electro-Optic devices and systems **under true "natural" light conditions** at the outdoor test range. As no urban areas are near the facility, urban "back lighting" of the sky is not present to adversely affect testing to simulate operational conditions.

SYNERGIES OF CO-LOCATION - Many of the functions performed at the Crane Division, Naval Surface Warfare Center **require access to other facilities and capabilities co-located on the base** in order to accomplish their missions. These facilities/capabilities include:

- *Environmental simulation facilities such as humidity, temperature cycling, vibration, shock, altitude, sun/rain, sand/dust, salt spray, jolt, and jumble;*
- *X-ray facilities including real-time capability;*
- *Ordnance materials analysis lab;*
- *Circuit card engineering and repair support;*
- *Cable engineering, repair and manufacturing support;*
- *Mounting platforms and brackets;*
- *System interface testing;*
- *Battery engineering and test support;*
- *Failure Analysis of components;*
- *Documentation Control;*
- *Acquisition (contracting) of repair parts, complete equipment, and support materials and equipment;*
- *Automated material handling facility for storage of material for staging/repair/issue;*
- *Video tape generation/editing and Graphic Arts;*
- *Firing Ranges and Range Support for Lasers and/or Weapon Sights/Fire Control Testing;*
- *Equipment Calibration Support;*
- *Defense Reutilization and Marketing Office for recycling and disposal of test and analysis samples.*

These facilities are unique from the standpoint they are Navy owned and operated. This gives complete control over physical security. For example, this eliminates problems such as coordination with Coast Guard and/or municipal authorities concerning safety issues relating to humans and marine mammals as well as other environmental issues. Another advantage is that test and evaluation activities can be controlled and executed with **no interference from civil marine traffic** unlike test facilities in densely populated coastal areas. The result is effective execution of test processes with minimal cost due to the avoidance of down time and **freedom from excessive public relations complications.**

Hydroacoustics - The Sonobuoy Life Cycle Engineering/Logistics Facility has been built over the past 30 years and has evolved as acoustic sensors have become more sophisticated and capable. Many facets of these evaluations (i.e. electronics, environmental, hydroacoustics, and magnetic) constitute an in-line process. **These evaluations must be performed in a particular order and within limited time frames.** This test capability was developed to accomplished this function. Many of the facilities of this capability are fixed assets. These include the Glendora Lake Facility and 1,000,000 lb. anechoic test tanks.

The Acoustic Systems Engineering/Depot Maintenance Facility co-located with fixed full spectrum hydroacoustic test facilities and a nearby quiet lake facility establish an acoustic system depot capability unmatched anywhere else in the United States. This allows the "dry side" or equipment installed inside of ships and the "wet side" or sensors which are mounted

outboard of vessels to be integrated in a test/evaluation and maintenance complex at **a single geographic location which produces truly full spectrum equipment support for the Navy.** Clustered environmental test facilities, machining operations and a myriad of other industrial and engineering services **generate a synergetic effect that yields process effectiveness and efficiencies that would be practically impossible to duplicate.** Essentially any conceivable service or support requirement can be obtained "in-house". Complications such as contracting delays, non-uniform testing, excessive material shipping and handling efforts and expense as well as redundant coordination costs are avoided. This integrated facility allows for **effective and efficient management by higher authority** due to reduced lines of communication and the luxury of having many coordination and planning tasks performed on-site which could not be possible with widely dispersed activities. An additional relevant advantage with strategic value is its **virtually unlimited storage capacity and extensive material handling capability.** This is imperative since many systems no longer receive any form of original manufacturer support. Vast quantities of decommissioned material is retained here and serves as a source of supply for critical/obsolete material requirements. These storage and material handling capabilities **furnish invaluable mobilization capacity.**

These facilities are **unique from the standpoint they are Navy owned and operated.** This gives **complete control over physical security.** An added benefit is **location in a remote rural area which naturally reduces public relations concerns.** For example, this eliminates problems such as coordination with Coast Guard and/or municipal authorities concerning safety issues relating to humans and marine mammals as well as other environmental issues. Another advantage is that test and evaluation activities can be controlled and executed with no interference from civil marine traffic unlike test facilities in densely populated coastal areas. The result is effective execution of testing with minimal cost due to the avoidance of down time and freedom from excessive public relations complications.

Conventional Ammunition Engineering - The Crane Division is a unique Navy activity in that significant Single Manager for Conventional Ammunition (SMCA) production is performed by CAAA, the Army tenant, located at Crane. **Fifty-eight percent of CAAA's ordnance magazine storage (1.9 million square feet) contains Navy/Marine Corps Ammunition assets.** Co-location of the Program Management and engineering functions with a major DOD ammunition production, storage, maintenance and disposal activity provides rapid response capability throughout the life cycle to major regional conflicts such as Operation Desert Shield/Desert Storm.

The synergy generated due to the co-location of program management, engineering, logistics, and repair personnel, facilities and equipment is immeasurable. Virtually any conceivable service or support requirement can be obtained "in-house." Crane has developed the ability to manage, acquire, assess, test, evaluate, maintain, repair (intermediate and depot level) and provide engineering and field support for components, equipment and systems. By obtaining required support from other Technical Capabilities and organizations within the Division, **internal duplication of capabilities is avoided** and utilization of facilities,

equipment and expertise is optimized for efficiency. Complications such as contracting delays, non-uniform testing, excessive material shipping and handling efforts and expense and redundant coordination costs are also avoided. Costs are minimized and capabilities are enhanced by broadening of application and increased usage.

An additional relevant advantage of this site is its storage capacity. This has been imperative since **many systems no longer receive any form of original manufacturer support.** Vast quantities of decommissioned material is retained here and serves as a source of supply for critical/obsolete material requirements.

EDUCATIONAL SUPPORT and RECRUITMENT - Although Indiana is noted as a major producer and exporter of consumer and industrial electronic goods, **Crane Division has little local competition for people with skills in electronics.** The Division is centrally located with respect to some of the world's largest and most highly regarded schools of engineering. In addition, a number of nearby schools and universities offer two year Associate degrees in electronics.

Quality of Life - Crane Division is the largest employer of engineers in Southern Indiana. The low cost of living (including cost of housing) at both sites, ample/free parking, and ease in getting to work result in extremely low attrition rates. **Thus far there has been no need to offer recruitment or retention bonuses to either acquire or retain technical personnel.** The low cost of living is supported by the fact that we are covered under RUS (Rest of United States) insofar as locality pay is concerned.

Recruitment - There are a number of reputable engineering schools within a 100-150 mile radius of Crane: Purdue University, the University of Evansville, Rose-Hulman Institute of Technology, the University of Cincinnati, IUPUI, and the University of Louisville. **We have had approximately 1,000 engineering applications in our files within the past two-three years.** In addition, there are a number of technical schools in the local areas which furnish a substantial supply of electronic, electrical, and mechanical engineering technicians. These technical programs include both two-year and four-year curricula.

Cooperative Education - Crane's centralized location also makes it a prime contender for Co-operative education students. **In recent years the Crane Division has had one of the largest Co-op programs in Navy.** Upon graduation 60-80% of the students accept permanent job offers with the Activity.

Future Industrial Base - Crane Division, Naval Surface Warfare Center, the Naval Air Warfare Center Indianapolis, and Indiana University-Purdue University at Indianapolis have evolved a unique partnership to create the **Electronics Manufacturing Productivity Facility**, centrally located in Indianapolis, Indiana. This state-of-the-art facility teams with industry, academia, and the Navy to provide training, workshops, and technical consultation for a wide variety of electronic manufacturing and repair needs.

TRANSPORTATION - Crane Division's geographic location enhances support to the fleet through **ready access to corridors of transportation.**

Volume - The shipment volume at the Crane Division for FY93 was 27,059 Navy fleet shipments and 4,047 Ordnance Government Bill of Lading (GBL's). **Crane Division utilizes the automated Conus Freight Management Field Module** (CFM-FM) system to process shipments and to provide compatibility with Military Traffic Management Command for routings, GBL generation, and carrier performance data.

Access to Air - Located just five miles from downtown Louisville and minutes from the Louisville site of the Crane Division is Standiford field. It is serviced by 18 different airlines with over 100 flights per day. According to the Airports Association Council International, **Standiford field is the 10th largest air cargo airport in the world and the fifth largest within the U.S.** A $400 million dollar expansion to add parallel runways is now underway.

Standiford field is the national air-freight Hub site for United Parcel Service's (UPS). **All shipments with UPS come through this Hub site.** UPS has a sorting capacity of 160,000 packages or documents per hour supported by over 86 flights per day. **UPS serves over 180 countries and territories.** Services offered include; Next-day, Second-Day, Comprehensive logistics capabilities, and On-Site customs clearance.

Located approximately 80 miles north of the Crane site is Indianapolis International Airport. **This airport ranks 11th in the U.S. for cargo shipments.** A Federal Express hub, U.S. Postal Service Eagle Air hub, and United Airlines' $800 million dollar air maintenance hub are located here. **It is also the home of the Greater Indianapolis Foreign Trade Zone.**

Access to Rail - Crane site of the Naval Surface Warfare Center has **over 150 miles of railroad track** providing access to the facility's storage areas. This track accommodates the 89-foot flat cars used when shipping Milvans and Seavans. Crane Site is serviced by the Soo Line which interconnects at Chicago, Kansas City, and Louisville. **The Louisville area is served by five rail lines:** the Soo Line, CSX Transportation, Conrail, Norfolk Southern Corp., and the Paducah & Louisville. Cities within two days rail travel from Louisville include; Atlanta, Chicago, Memphis, Minneapolis, and St. Louis. **Average rail time to east and west coast locations are six and ten days, respectively.** CSX's main north and south line runs through nearby Evansville, Indiana.

Access to Waterways - Between the Crane and Louisville sites is the Ohio River, **the major waterway to Cincinnati, Pittsburgh, St. Louis, Memphis, New Orleans and the Gulf of Mexico seaports.** The Louisville and Jefferson County Riverport Authority, the Clark Maritime Center (part of the Indiana port system), and numerous private facilities provide state-of-the-art trans-loading capabilities. Clark Maritime in Jeffersonville, Indiana covers

830 acres and offers storage, towing and fleeting, barge cleaning and repair, switching, and heavy lifting up to 450 tons. **Ports are also available in Evansville,Indiana and the Great Lakes area.**

Louisville's Foreign Trade Zone, with customs clearance, is located within the Jefferson Riverport International's 1,600 acres and **offers benefits to those involved in overseas markets.**

Access to Highways - The City of Louisville is served by three major interstate highways: I-64, I-65, and I-71. The Indianapolis area, just north of the Crane site, is a hub for four major interstate highways: I-70, I-74, I-65, and I-69. A proposed extension of I-69 south to I-64 is scheduled to begin construction in 1996. **This southern extension is slated to pass within a mile of the Crane site.** When completed, I-69 will link the Great Lakes and Canada with the Mexico and the rest of Central and South America. The current plan will link such cities as Evansville, Indiana, Memphis, Tennessee, Shreveport, Louisiana, and Houston, Texas.

This region is serviced by over 40 motor carriers, including most of the major freight companies. **These carriers can provide service to all 48 contiguous states, as well as Canada and Mexico, without interchange,** allowing Crane Division the opportunity to have carriers pickup additional freight as trucks pass through the area. **Due to the number of major carriers and shipping volume, the trucking rates in the Crane Division area are very competitive.**

Access to Suppliers - **Crane Division is located within 500 miles of nearly 50 percent of the U.S. consumer markets and within 650 miles of 65 percent of the population of the United States.** Because of the Crane site's shipping volume, two transportation companies, Baggett Transportation and Boyle Transportation, have Terminals just outside Crane's boundaries. They offer quick service for "hot" emergency shipments. After material is loaded, **trucks deliver to the East coast in 12 hours and to the West coast in 36-48 hours.**

b. WHAT IS THE IMPORTANCE OF THE PRESENT LOCATION RELATIVE TO CUSTOMERS SUPPORTED?

CENTRAL LOCATION - Crane Division's central geographic location makes travel to either coast relatively equally convenient. Suppliers are dispersed throughout the country and travel to their locations is also made with greater ease. **This results in lower average time and costs for personnel travel and material shipments.** This advantage, combined with the on-site synergetic effects previously discussed, present customers with the opportunity of utilizing a maintenance and engineering resource that **can provide superior cost controlled services and project them throughout the country with similar ease.**

For example, 75 percent of ammunition component and end item production by both industry and government is within 750 miles (38 percent within 500 miles) of Crane Division, **allowing almost same-day response to resolve on-site production related problems.** The maintenance of product expertise is the only means available to **assure safe, reliable and effective ammunition to satisfy Fleet requirements.**

Other customers supported are the military users located world-wide. On-site assistance is required with many of the equipments and systems supported by Crane personnel, and is currently being provided or has recently been provided in **Southwest Asia, Alaska, Cuba, Africa, Central America, Hawaii, Japan, Taiwan, and numerous CONUS locations for Navy, Army, Marine Corp, Special Operations Forces and Foreign Military customers.**

Crane Division has convenient access to two major airports, transcontinental rail lines, and the Interstate Highway System, and is **fully connected to global data networks.**

Being centrally located within the country results in **lower average time and cost for personnel travel and material shipments.** This benefit, combined with the **synergetic and geographic advantages** previously discussed, present customers with the opportunity of utilizing **a maintenance and engineering resource** that can **provide superior cost controlled services and project them throughout the country with similar ease.**

Geographic, continued

2. Environmental Compliance

Answers to the following questions need to reflect the particular workloads or processes affected by the environmental restrictions/compliance.

2.1 Is your activity in full compliance with all Federal, state, and local environmental regulations? If not in full compliance, provide a comprehensive list of individual regulations that require actions to be taken. What compliance waivers have been granted? When must the activity come into compliance?

Type	Regulation	Waiver (Date Expires)	Date Must be in Compliance
NPDES	327IAC5-1 327IAC5-2	Agreed Order - No Expiration Date	8/94 for STP Modification and for NH3; Upon NPDES permit revewal for CN; 30 days after lead compliance plan schedule is achieved.
Air Operation Permits	326IAC2-1	Memo from IDEM inspector acknowledging that decisions on what sources to permit will be made upon completion of emmisions inventory.	No dates established in memo. Expect permit applications to be submitted by 11/95.

2.2 Has any actual or programmed work at this installation been restricted or delayed because of environmental considerations, such as air or water quality? If so, provide the details of the impact of the restrictions or delays.

Programmed Work	Restriction/Delay	Describe Impact
No		

3. Environmental Restrictions

Answers to the following questions need to reflect the particular workloads or processes affected by the environmental restrictions/compliance.

3.1 Are there any special programs relating to environmental or industrial waste considerations for your activity? If so, provide the details.

Special Program	Environmental/Industrial Waste	Describe
No		

3.2 Within what provisions must the activity operate with regard to disposal of hazardous wastes and radioactive materials?

Type	Provisions	Describe
Code of Federal Regulation 40 CFR 260-272		
329 IAC (Indiana Administrative Code) Rule 3-1 through Rule 3-59		
These regulations set forth requirements/guidelines pertaining to the proper management of HW, permiting and operation of Hazardous Waste Treatment, Storage Disposal Facilities.		

Geographic, continued

4. Other Collocated Activities

4.1 Are there any collocated activities that directly benefit or relate to the depot maintenance activity? If yes, list and describe the impact of each. Include benefits derived from being collocated.

Crane Army Ammunition Activity Machining Operations - Provides machining capability for modification and production of mechanical subassemblies and piece parts. Direct access to production personnel reduces drawings/specification interpretation problems and minimized rework requirements. Readily available source of supply for mechanical components. Reduces response time versus the private manufacturing sector traditionally known for long lead times.

Defense Reutilization Management Office (DRMO) - Provides a convenient and efficient means of disposal of obsolete and excess material and equipment varying from airborne assemblies, radar components and systems to specialized test systems. This office is utilized for scrapping of microwave tubes either beyond economical repair or no longer required. The close proximity of this office reduces storage times and costs.

Hydroacoustic Test Facility - Provides complete in-process and final hydrostatic acceptance testing of cables, transducers, etc. Final system integration and acoustic acceptance testing. Collocation generated synergy between depot and test personnel yields a robust test capability for both "dry" and "wet" side acoustic system testing. Responsive in-line system and component testing. Minimal coordination efforts and reduced process costs due to single site convenience.

Elastomer Laboratory - Develops and produces specialty molded elastomer products (acoustic windows, seals, etc.) for repair of sensors, cables, and other underwater components. Effective source of unique repair parts. Procurement lead times eliminated due to "in-house" source.

Explosive Sciences Materials Analysis Laboratory - Performs extensive material and fluid analysis functions for mechanical and hydraulic systems and components. Timely and accessible source for non-destructive and SUBSAFE certification testing.

Environmental Test Laboratories - Provides environmental test and evaluation of system/component upgrade items. Provides environmental stress screening services. Convenient source to supplement final acceptance testing operations. Permits efficient test scheduling and execution.

Crane Army Ammunition Activity Machining Operations - Provides machining capability for modification and production of mechanical subassemblies and piece parts. Direct access to production personnel reduces drawings/specification interpretation problems and minimized rework requirements. Readily available source of supply for mechanical components. Reduces response time versus the private manufacturing sector traditionally known for long lead times.

Storage and Material Management Facilities - Stores depot repairables and materials. Provides material movement services. Makes possible "same day" material delivery service. Performs shipping/receiving functions. Convenient and practically unlimited storage capacity at a negligible cost.

Advanced Technology Failure Analysis Laboratory - Performs failure analysis on electronic components including integrated circuit evaluation and substrate analysis. Enables failure analysis research including interior semi-conductor examinations to completely reconstruct equipment failures.

NSWC Crane is the Quality Evaluation (QE) test facility for the Sidewinder missile TDD (DSU-15B, DSU-15A/B, and DSU-21B) as well as the Safety and Arming Device (SAD, Mk 13 MOD 0 and Mk 13 MOD 2). They currently share test equipment and engineering support for both functions (QE and depot). The TDD and SAD must be collocated because together they form the Sidewinder Missile Fuzing System.

4.2 Do collocated activities support, or are they supported by, the depot maintenance activity?

Collocated Activity Describe Relationship

Crane Army Ammunition Defense Reutilization Office (DRMO)

The two collocated activities support the Electronic Warfare Depots, Night and Activity and the Vision and Electro-Optical Equipment Depot, Radar Depot and the Microwave Tube Test Evaluation and Repair Facility; none of the collocated activities are supported by the Depots.

Hydroacoustic Test Facility - Mutually supportive. Directly supports the depot activity by simulating the operating environment of systems and components. The test facility supports the depot by uniquely simulating the operating environment of systems and components. This provides acoustic testing that is much more sensitive and accurate than could be obtained at coastal sites. The depot activity supplies test personnel with detailed equipment operational knowledge. This combination is mutually beneficial for producing efficient test processes and reducing costs to the Navy.

Elastomer Laboratory - Directly supports the depot activity as a source of supply of elastomer products.

Explosive Sciences Materials Analysis Laboratory - Directly supports the depot activity by providing metallurgical and wet chemical analysis of acoustic and hydraulic components.

Environmental Test Facilities - Directly supports the depot activity providing in-service operating conditions for acceptance testing and screening.

Crane Army Ammunition Activity Machining Operations - Directly supports the depot activity by manufacturing/altering machined components.

Storage and Material Management Facilities - Directly supports the depot activity by storing repairables, piece parts, etc.

Advanced Technology Failure Analysis Laboratory - Directly supports the depot activity by evaluation of failed material.

Acoustic System In-service and Acquisition Engineering Activities - Mutually supportive. The depot activity receives in-depth specialized technical support, while in return the depot activity provides technicians for diagnostics, prototype/test fixture fabrication, fleet training, and other user support. Personnel sharing eliminates the duplication of technical expertise at separate sites.

Corrosion Control - Receives work from and is funded by maintenance activities at Crane. Depots benefit from close proximity. This allows local oversight, good communications, and contracting cost avoidance associated with utilizing commercial sources.

Failure Analysis - Receives work and funding from local maintenance activities, ISEA's and Program Offices. Supports local maintenance activities by investigating material failures.

EMPF (Indianapolis) - Supports maintenance activities by providing special process training and certification to depot personnel. Receives support (tuition) from maintenance activities.

Technical Support - Provides drafting, CAD, and desktop publishing services to maintenance activities to support technical drawing packages, technical manuals and procedures. Receives funding from depots for this support.

ISEA's - Receives funding from Program Offices. Supports Organizational, Intermediate and Depot Level maintenance activities. Supports depot activities by providing technical oversight, configuration and logistical support.

4. Other Collocated Activities, continued

4.3 How would these activities and the depot maintenance activity function if they were not collocated?

Collocated Activity Describe Impact if not Collocated

Defense Reutilization Management Office (DRMO) - Without the local DRMO the disposal operation would be less efficient with additional transportation costs generated moving material to another site. Probably a greater expense would be the lack of the bi-weekly visits to DRMO to assure that no mistakes have been made in the process causing needed useable material to be excessed. Past experience has indicated these "process checks" have yielded large dividends.

Hydro Acoustic Test Facility - The hydroacoustic test facility workload would be reduced causing higher rates for remaining customers if the depot testing was performed elsewhere. **The depot activity would have to purchase the same test services elsewhere.** It would not be practical to establish full time hydroacoustic test facilities/services for this depot activity alone. Rates are generally higher at other navy facilities and **costs** associated with shipping, in-process delays, etc. **would increase** if the performing activity did not have appropriate facilities.

Acoustic System In-service and Acquisition Engineering Activities - Provide technical support to depot operations including testing, failure analysis, obsolete part substitution, etc. This engineering/ depot combination is an exceptional advantage that concentrates technical expertise reducing overall depot operating costs and lowers mean time to repair standards. Makes in-depth system knowledge available to depot personnel. Provides responsive support to reduce troubleshooting durations, testability problems, etc. A vital component to depot operability.

Corrosion Control

Chemical conversion coating, painting, and corrosion control for depot repairables.

Rapid turn around time, process control.

Machine Shop Services (Louisville and Crane)

Manufacture of parts to support depots.

Rapid turn around time, process control.

Failure Analysis

Fault investigation.

Cost avoidance through failure analysis.

EMPF (Indianapolis)

Special process training.

Low training cost.

Technical Support

Drafting, CAD, desktop publishing.

Rapid documentation support.

In-Service Engineering Agents (ISEA)

Configuration management ILS, direct fleet support depot technical oversight.

Rapid exchange of technical data, improves depot/fleet relationship.

Elastomer Laboratory - **The depot activity would need to procure this support elsewhere** as establishing this capability within the depot would be cost prohibitive. **Repair part lead times would increase and additional resources would be committed** to procurement actions, shipping delays, etc. would result. **Higher costs could result** for remaining naval elastomer laboratory customers for this specialized product line.

Explosive Sciences Materials Analysis - The depot activity would require these services from another source. In addition, the **new source would be required to be certified for SUBSAFE work**, this would limit competition and likely be more costly in the private sector. This would mean **longer in-process times** for services. The effect on the laboratory would be minimal.

Environmental Test Facilities - Duplication of these facilities within the depot operation would be impossible and would be obtained elsewhere causing in-process delays. Environmental test cost impact is uncertain.

Crane Army Ammunition Activity Machining Operations - **Machining services would be required from other sources**. This would increase in-process and shipping durations. This would force the stocking of additional machined spares causing **inventory costs to rise. Rework times and machine stock waste would increase** due to customary and inevitable inaccurate documentation interpretation errors that could no longer be immediately reconciled on-site with zero travel expense. Impact to the machine operation is unknown.

Storage and Material Management Facilities - Depot **operations would be severely impacted** due to the need for massive amounts of out of service equipment storage. This is required for cannibalization of obsolete and critical parts. **Storage at other sites would be extremely impractical and costly.** The storage facility would still function, but other customers could see slight increases in their storage costs.

Advanced Technology Failure Analysis Laboratory - **The depot activity would require these services form another source. Identification** of such a source would be **difficult due to specialized equipment** required for military electronics analysis. Effect on the laboratory would be minimal.

Acoustic System In-service Acquisition Engineering Agent - **Significant damage would result** to both the engineering and depot and activities. **Efficiency would decrease** due to the variety of skills required supporting electronics, computers, software, mechanics, operation, training, documentation, etc. which is housed in both activities. **Separation would cause duplication of effort and increase system life cycle costs.**

Corrosion Control - Higher cost to do business, longer repairable turn around time, less process control.

Failure Analysis - Depots would be unable to start the investigative process as quickly. Costs would be higher and time to yield results would increase.

EMPF - Higher travel and tuition cost. Less consistent training, less depot input to curriculum.

*Technical Support - Drawing and procedure development would stretch out significantly. Costs to develop would increase.

*ISEA's - Slower information exchanges, less depot oversight, fleet has less ready access to depot technical base.

* If these two activities were not collocated, it would require duplication of equipment and engineering not currently required.

5. Encroachment

5.1 Have operations at this activity been at all constrained to accommodate requests of the local communities?

Type of Encroachment	Operation Impacted	Describe
No		

5.2 Indicate any encroachment constraints on current or future operations that would restrict future expansion.

Type of Encroachment	Constraint on Expansion	Describe

Located in the rolling hills of southwestern Indiana, the Crane Site has no encroachment constraints on current or future operations that would restrict expansion capability.

MEASURES OF MERIT

Facilities and Equipage

6. Unique or Peculiar Facilities

6.1 List unique or peculiar testing facilities, excluding equipment (e.g. runways, railheads, ports, tracks, ponds, etc.).

Test Facility Describe Uniqueness/Peculiarity

Ram Air Turbine Test Facility - This facility is a wind tunnel with computer controlled air speed and test section large enough to accommodate a ram air turbine.

RF Anechoic Test Chamber - This facility provides an economical means of testing microwave antennas used on various electronic warfare systems. It is sized for smaller antennas and will not accommodate the very large surface search radar antennas.

RF Test Range - This facility provides an absolute antenna test, duplicating the far field conditions experienced in operation and will accommodate antennas used on surface surveillance radars.

Antenna Test Facility - This facility is a unique combination of technically interrelated capabilities; the Antenna Gear Metrology facility and the Shipboard Windload and Vibration Simulation Facility. This facility provides capability for performance testing, engineering investigation and failure analysis of the mechanical components and system which form a radar antenna. The facility is sized to handle the large shipboard antennas.

Shipboard RadarSystem Test Facility - The uniqueness of this facility is its ability to test a large number of systems; SPS-40, SPS-48, SPS-49, SPS-64, SPS-67, MK 23 and MK 92 systems. The facility provides the specialized "hotel" services (dry air, pure water and required electrical power) necessary to the systems operation and the cabling simulating the shipboard environment. This provides the capability for complete electrical performance testing of all elements of the systems and provides the ability to evaluate proposed system changes before installation in the Fleet.

Failure Analysis Laboratory - The facility provides state-of-the-art electronic failure analysis capability. The available equipment has the capability to trouble shoot and make electrical measurements on all electronic components including measurements within an operating microcircuit to isolate the failed portion of the chip and determine the cause of the failure.

Materials Analysis Laboratory - The facility provides materials analysis testing capability unmatched in the Navy or DoD. The laboratory has the capability to determine the chemical composition of samples of material from bulk samples to surface films 10 angstroms in thickness.

Hydroacoustic Test Facility - **The composite capabilities** for providing total underwater acoustic evaluations in free field littoral and simulated ocean environments (temperature and pressure) **are unique within DoD. Following are** some of the individual facility **characteristics that are unique within DoD**:

a) ANECHOIC TANK FACILITY. The anechoic test facility comprises the largest high pressure tanks devices at simulated temperatures (2 to 50 degrees c) and depth (over 5700 feet).

Efficiency and production capacity is also unique because of multiple tanks.

b) GLENDORA LAKE. The combination of features that make this facility unique are:
- 10' deep x 5100' long test area
- remote/quiet environment (quiet relative to low frequency sonobuoy requirements, remote locations and highwall boundaries reduce airborne noise, wind, etc.)
- Controlled/secure access (completely navy owned)
- natural "littoral" (sloped) test/training site

c) LOW FREQUENCY CALIBRATOR. Capability to calibrate sensitivity and directivity of pressure gradient hydrophones down to 5 hz at pressures to 10,000 psi at simulated ocean temperatures is unique within the navy.

Elastomer Laboratory - **The combined capabilities of this facility are not reproduced at any other site within the naval establishment**. Equipment includes environmental chambers, curing ovens, unique molds, oil fill room, walk-in freezer and specialized test equipment **peculiar** to elastomer technology.

Explosive Sciences Materials Analysis Laboratory - **The aggregate** of the following **capabilities combined with a SUBSAFE certification a unique facility** to support depot operations. Capabilities include:

a) non-destructive testing (ndt), including eddy current, ultrasonic, and dye penetrant inspection.

b) metallurgical and mechanical physical properties testing, performing hardness tests, stress-strain analysis, impact tests, and toughness tests.

c) standard wet chemical analysis, including complete quantitative analysis and metal spot (qualitative) testing.

d) micro-analytical instrument lab, including energy dispersive x-ray scanning electron microscope for fracture analysis, and fourier transfer infrared spectroscopy, for hydraulic fluid analysis and compatibility studies.

Advanced Technology Failure Analysis Laboratory - The purpose of electronic component evaluation due to the vast array of ultra sensitive diagnostic equipment. Included are:

a) Residual gas analysis equipment

b) Plasma etcher

c) Scanning electron microscopes with EES capability

d) Scanning auger (for surface analysis with 10 atomic layer sensitivity)

e) Scanning ion mass spectrometer

f) Electron probe (wavelength dispersive spectrometry)

The Sensitive Compartmented Information Facility (SCIF) -- Requires TEMPEST protection from electronic and other eavesdropping to facilitate high security repair operations. Once certified these facilities take over one year to be replaced in another location. Also strict procedures must be followed to decommission the SCIF and move secret material, equipment, and knowledge. This is one of the few DOD sites that allows security for both data exchanges and repair workload.

The Model Depot Facility -- Is currently in the final phases of construction. It is a new 70,500 square foot state-of-the-art Paperless Automated Depot designed specifically for screening, evaluation, and repair of military and commercial electronic modules and related hardware.

Repair technicians are connected via a fiber optic network to a central computer system which can provide automated repairables induction, traveler, financial data, parts retrieval, drawings, procedures, and inventory status information. This automated system has been developed internally and is now in trial use in existing depot operations with very good results to date.

The Model Depot will incorporate an Automated Storage and Retrieval System (ASRS) for repairables, repair parts, and materials. Automatic Guided Vehicles will transport needed materials in a closed loop from the ASRS to repair technicians.

This facility will also be interconnected with the Crane Division Office Mail system. This will allow managers located in the Model Depot to have virtually instantaneous electronic communication with local customers and with external customers worldwide via Internet and the Defense Data Network.

The facility incorporates Liquid Nitrogen Storage Tanks and Dry Nitrogen into an integrated network of associated piping to allow direct supplying of these resources to the Work Stations. 3 Phase Power of varied cycles, amperage and voltage; and multiple outlets allows flexibility in floor space usage and permits drastic changes in the scope of the work being performed in an area. Compressed Air can piped to Work Stations at up to 120CFM/100PSI via a grided piping system that allows access to all areas of the building. Power Conditioning modulates voltage fluctuations, Uninterruptable Power Source (UPS) protect data, and Phase Protectors protect equipment during Brown Outs.

The Model Depot Facility will be completed in July 1994. It will be the first of its kind within the Navy.

The Ceramic Multilayer Repair Facility -- Serves as the technology base for the Navy. Utilizes expensive system level testers, state of the art repair equipment, extensive environmental testing equipment to conduct environmental stress screening, and replacement part remanufacture to effect repairs. Sophisticated nitrogen ovens are used to produce sample and limited production runs for technology insertion and materials qualification.

The Precision Rotating Components Repair Facility -- Requires stabilization platforms (foundations) for seismic shock/vibration isolation. The equipment/facilities were established over a 30 year period of time beginning in the early sixties. Since that time, numerous equipment additions and upgrades have been funded by a variety of NAVSEA programs. Equipment in most cases is relatively new, but the background knowledge to use them is invested in the people. This facility is the one place in the DOD where the entire overhaul/repair capabilities knowledge base exists. This is the only place that can completely disassemble, repair, and reassemble these mechanical systems.

The Fin Stabilizer Facility -- This is the only facility that can be used for both maintenance and training. The original cost to build was $2.5M and developed incrementally over several years. A maintenance spare for rapid deployment to the fleet is part of test system. The system occupies 7000 cubic feet and weighs 18 ton. This the only place where design improvements and upgrades can be made without incapacitating a ship. The cost to move this system would be over $50K, and the system could only be moved into a facility that has an overhead crane, 20 ft head clearance, and extensive electronic and mechanical repair capabilities.

Building 364 has a unique room for assembly of TDD's. The relative humidity can be controlled to a level lower than 5% RH. This room also has special air ionizers to control static electricity.

6.2 Indicate the reasons that these facilities are required by the depot maintenance function.

Test Facility — Reasons Required for Maintenance

Ram Air Turbine Test Facility - The ram air turbine generates all the electrical power used by the AN/ALQ-99 system; when a turbine has been repaired this facility allows testing to determine condition. The facility allows programming air speed to simulate flight profiles experienced in actual mission operations.

RF Anechoic Test Chamber - Before system components can be returned to the Fleet the antenna gain and pattern must be checked to assure proper operation. Without these crucial components the electronic warfare equipment could not properly radiate their jamming signals and accomplish their mission even with functioning electronics. The accurate assessment of the receiving antennas used in the system is also critical since they are needed to predict the threat generating the received radiation and its approximate location. Additionally, without correct antenna patterns the system could easily be degraded by electromagnetic interference from its own and other nearby antennas. Radar antenna gain and pattern are also critical to determination of position, bearing and range, of targets acquired by the system.

RF Test Range - Although the anechoic chamber is the most economical means of testing antennas in a production environment, it records data and uses computers to analyze the data and predict actual operation. The far field range allows measurements to be taken duplicating operating conditions and periodically correlating and validating data from the anechoic chamber. It also provides the capability to make far field measurement on the very large, approximately 17 feet square, shipboard surveillance radar antennas. This facility also allows full power operation to test conditions to be encountered after shipboard installation.

Antenna Test Facility - Provides the necessary capability to test the mechanical components and system comprising the radar antenna after repair. The facility also provides first article testing of products from new manufacturers.

Shipboard Radar System Test Facility - Provides the capability for testing repaired system components in a environment duplicating that to be found on shipboard.

Failure Analysis Laboratory - The facility provides the Depots, repair and test facilities and operations the ability to investigate the cause of failure of electronic components. When high rates of failure are experienced on specific components it allows failure determination and feedback to the engineering group to provide a timely permanent fix to the problem.

Materials Analysis Laboratory - Provides the capability to determine what materials are present in various contaminants found in the equipment. The source of this material could be from component deterioration, corrosion or foreign material intrusion all of which will cause the equipment to fail in the future.

Hydroacousitc Test Facility - Selected acoustic systems and components **must be tested acoustically in their in-service environment** for survivability and performance accuracy before delivery to the fleet. Integration testing is also performed to validate complete system operation within design parameters.

Elastomer Laboratory - **Produces specialty molded products** (underwater cables, gaskets, seals, shockmounts, acoustic windows, etc.) to supply unique repair parts for depot operations. Performs design and reverse engineering for unique elastomer parts replacement.

Explosive SciencesMaterials Analysis Laboratory - Frequently, the depot activity **must manufacture or procure SUBSAFE parts**. Before use, **they must be certified** by non-destructive testing as acceptable. Also, the towed array handling test stand hydraulic fluid must be periodically inspected for contaminants to meet design specifications. Other uses of the laboratory include qualitative spot testing of **SUBSAFE** raw materials, verifying compliance with the appropriate specifications, and analyzing materials which have failed in the fleet.

Advanced Technology Failure Analysis Laboratory - At times, failed **components cannot be completely analyzed with depot level maintenance procedures and equipment.** The in-depth electronic analysis of this laboratory supplements depot and in-service engineering failure analysis capabilities.

The Sensitive Compartmented Information Facility (SCIF) -- NSG and NSA have top secret electronic modules that need to be repaired. This is the only kind of facility that is authorized for use to preform that depot function.

The Model Depot Facility -- In order to service the Fleet, keep inventory costs low, and meet just in time fleet stocking policy the Model Depot Facility reduces labor costs and repair turn around times.

The Ceramic Multilayer Repair Facility -- State of the art electronics requires sophisticated testers, elaborate environmental controls, exotic support equipment, and experienced personnel to effect repairs.

The Precision Rotating Components Repair Facility -- The adjustments required during repair require close tolerance that can only be obtained using stabilized platforms. Also the close tolerances require a clean room repair environment.

The Fin Stabilizer Facility -- The design of this system was done at NSWC Crane and the expertise could not be easily duplicated. This facility is required to test the all up system.

This is a requirement to store the open unit.

6.3 How could the depot maintenance functions be performed without these specialized facilities?

Test Facility	Describe Testing Alternatives

Ram Air Turbine Test Facility - The turbine could be mechanically rotated testing only its electrical generating capability without testing its aerodynamic drive and control sections. For complete testing another facility would have to be found or developed. Use of existing general purpose wind tunnels located at other activities would mean scheduling difficulties to match production operations and dramatically higher costs for use of the more complex and sophisticated wind tunnels.

RF Anechoic Test Chamber - The only alternative would be to do all testing in the farfield antenna test range at substantially greater costs. The antennas must be tested before returning the equipment to a Ready for Issue condition. Without these antenna testing facilities the depot would need to send antennas to an engineering or research activity for testing; this would greatly complicate the ability to detect electromagnetic interference problems that would degrade system operation if left uncorrected.

RF Test Range - The anechoic chamber would need to be used for all measurements losing the capability for the periodic validation of the anechoic chamber and the testing of the large shipboard radar antennas.

Antenna Test Facility and Shipboard Radar System Test Facility - Similar facilities would need to be developed at another activity or commercial site since this testing is required before the radar antennas and system components can be returned to the ships.

Failure Analysis Laboratory - Components would need to be sent to laboratories at other activities or the private sector for the analysis. This would generate unacceptable delays before solutions could be incorporated into the depot operations, and more repairables would flow through the depots without the corrective action required generating higher costs and lower readiness.

Materials Analysis Laboratory - Alternatives identical to the Failure Analysis Test Facility.

Hydroacousitc Test Facility - Some acoustic system maintenance could not be performed due to final test requirements. Other hydrostatic pressure and acoustic **test services would need to be purchased**. Minimal facilities would required:

a) a hydrostatic pressure tank large enough to accommodate the 18" diameter x 72" long, 500 lb. Transducer array

b) an open water acoustic test facility at least 100' deep with the capacity to handle, operate and calibrate a full-up 3300 lb. AN/WQM-6 test system.

Elastomer Laboratory - **Sensor repair could not be accomplished without this facility** and its special process equipment. Alternative sources with the ability to produce molded elastomer items would have to be identified.

Explosive Sciences Laboratory - While the periodic testing of the depot test stand hydraulic fluid might be supplanted by excessive periodical replacement of the fluid, this would cause **increased costs** and **unnecessary down time**, and an alternative source for **SUBSAFE certification requirements would be mandatory** to ensure fleet safety requirements.

Advanced Technology Failure Analysis Laboratory - The depot activity could function without this facility. However, increased fleet Failure and repair parts costs could increase due to undiscovered, and subsequently, uncorrected failure inducing design flaws.

The Sensitive Compartmented Information Facility (SCIF) -- Once certified these facilities take over one year to be duplicated at another location. Also strict procedures must be followed to decommission the SCIF and move top secret material, equipment, and knowledge. Another already certified facility is the only alternative.

The Model Depot Facility -- The work could be shifted to facilities that were not designed for electronic maintenance or to general labs. The first alternative would require renovation to meet minimum depot facility requirements. The second alternative would require that old manual methods of doing business continue into the future, at higher costs and longer lead times.

The Ceramic Multilayer Repair Facility -- Without another facility with similar capabilities the tests and repairs could not be made. High end testers could be replaced with low end testers, but the associated test procedures would take several years to develop and validate. Past experience shows that high end testers simulate the operating system better and thus provide more accurate test diagnosis which expedites the repair process.

The Precision Rotating Components Repair Facility -- Since no other facility has all the test and repair capabilities in one area, work would have to be split between facilities. This would fragment the total test and repair process resulting in greater lead times and higher costs. Expertise in the total repair operation would be lost.

The Fin Stabilizer Facility -- Since there are no other existing facilities, module test procedures would have to be developed to replace system test procedures resulting in higher costs.

7. Buildings and Their Condition

7.1 List the buildings used to perform the depot maintenance functions by category code numbers (five or six digit CCNs), identifying their current condition (adequate, substandard, and inadequate) in Table 7.1 in thousands of square feet (KSF).

Table 7.1: **Facility Conditions**

CCN	Facility Type	Condition / Area (# KSF)			Comments
		Adequate	Substandard	Inadequate	
44110	General Purpose Warehouse	585.9			
21210	Guided Missile Intergrated Facility	10.7			
21710	Electronics/ Communication Maintenance Shop	254.7			
	Total	851.3			

Facilities and Equipage, continued

7.2 In Table 7.2.a, identify space available for expansion by building type for those facility category code numbers (five or six digit CCNs) that are most important to your mission. An activity's expansion capability is a function of its ability to reconfigure/rehabilitate existing underutilized facilities to accept new or increased requirements.

Table 7.2.a: **Space Available for Expansion**

Building ID / Type	CCN	Installation Space (KSF)			Total
		Adequate	Substandard	Inadequate	
41	217-10	28			28
2521	217-10	4			4
36	217-10	3			3
2	217-10	21			21
37	217-10	35			35
121	217-10	23			23
2921	216-60	6			6
2951	216-60	2			2
2964	216-60	8			8
3007	216-60	2			2
353	217-77	10			10
354	217-77	10			10
355	217-77	10			10
2069	441-10	10			10
2070	441-10	10			10
2071	441-10	10			10
2072	441-10	10			10
2073	441-10	10			10
	TOTAL:	212			212

Facilities and Equipage, continued

8. Unique and/or Peculiar Capabilities and Capacities

8.1 What unique and/or peculiar capabilities and capacities does the depot maintenance activity possess?

Depot Maintenance Capability/Capacity Describe Why Unique/Peculiar

The AN/ALQ-99 maintenance depot is the only certified facility for the repair of the Navy version of the system and the items common between the Navy and Air Force systems. The common items represent about 65% of the Air Force system. This repair and test capability includes the electronic assemblies and components at all levels, interconnecting cables, mechanical repair of the specialized electronic housings, the pods which mount on the aircraft wings carrying the systems and the ram air turbine.

Upon completion in early 1995 of facilities currently under construction, the AN/SLQ-32 depot will be the only single activity capable of full system testing at component, subassembly and integrated system levels; the depot will be the only activity for which system restoration, including complete testing, will be practical. The depot is the most efficient and inexpensive for the systems, subassemblies and components repaired.

The unique feature of the Depots and the repair and test facilities located at the Crane Division that makes them irreplaceable is their existence in close proximity to a host of supporting and complementing engineering activities and other industrial operations in related product areas. The collocation of the Airborne Electronic Warfare Depot, the Surface Electronic Warfare Depot, Radar Depot, Microwave Tube Test and Repair Facility and the Night Vision Electro-optical Equipment Depot allows sharing of costly test and repair facilities such as the Corrosion Control Facility, RF Test Range, RF Anechoic Test Chamber, Solid State Devices Facility, Microwave Tube Facility, Printed Circuit Card Facility and Cable Fabrication Facility. Concern for the environment is reflected in the operation and design of the industrial activities such as the corrosion control facility which utilizes closed loop systems in many of its processes to minimize and eliminate the generation of hazardous wastes The support from engineering facilities such as the Failure Analysis Lab and Materials Analysis Lab allow rapid solution to problems found during depot repair but which generally exceed the capabilities of other depots. Equally as important is the location of the engineering and logistics functions supporting most of the same products as the depot. The collocation allows the lessons learned in the depot and the Fleet to be quickly fed back to the designers, manufacturers and engineering agents so that changes can be rapidly effected.

Crane is unique in that it has the only microwave tube repair facility within the CONUS with capability to rebuild "glass bulb" microwave tubes. Although not the technology used in state-of-the-art microwave tubes today, it is still the technology required to repair several microwave tubes in use in Navy radar transmitters.

Crane Division has the only known repair capability within government or industry for Generation I image intensifier tubes used in early night vision equipment.

OK-276/BQ Towed Array Handling System Test. These capabilities are unique within DoD. This is **the only facility** equipped and staffed to perform this function. This includes system level testing as well as individual unit testing. Hydraulic and electronic functions can be calibrated and mechanical cable properties evaluated. A wide range of deficiencies including excessive noise, hydraulic fluid leakage and electronic control system abnormalities can be detected. New design modifications can be "dry" tested without the logistics and financial complications fleet testing would entail. **This facility is the only certified repair activity** for this system.

The Sensitive Compartmented Information Facility (SCIF) -- Requires TEMPEST protection from electronic and other eavesdropping to facilitate high security operations. Once certified these facilities take over one year to be replaced in another location. Also strict procedures must be followed to decommission the SCIF and move secret material, equipment, and knowledge. This is one of the few DOD sites that allows security for both data exchanges and repair workload.

Full range test capability for TDDs.

8.2 Separately list the depot maintenance facilities and equipment which are one of a kind within the Service and/or DoD.

Facility/Equipment	Describe Why It is One of a Kind

The Model Depot Facility -- Is currently in the final phases of construction. It is a new 70,500 square foot state-of-the-art Paperless Automated Depot designed specifically for screening, evaluation, and repair of military and commercial electronic modules and related hardware.

Repair technicians are connected via a fiber optic network to a central computer system which can provide automated repairables induction, traveler, financial data, parts retrieval, drawings, procedures, and inventory status information. This automated system has been developed internally and is now in trial use in existing depot operations with very good results to date.

The Model Depot will incorporate an Automated Storage and Retrieval System (ASRS) for repairables, repair parts, and materials. Automatic Guided Vehicles will transport needed materials in a closed loop from the ASRS to repair technicians.

The electronic warfare depots are one-of-a-kind facilities because of the assemblage of test equipment, test facilities, industrial facilities and expertise. No single piece of equipment or single facility in most of the Depots and test and repair facilities at the Crane Division is unique; however the collocation of all the capabilities at one activity is unique and perfectly suited to operating the most responsive, efficient depots in DoD.

Microwave Tube Facility: Crane's Microwave Tube Test, Evaluation, and Repair Facility is the first and remains the only facility within the DoD with a complete range of microwave tube test, evaluation, and repair facilities. Microwave tubes requiring voltages of 50,000 volts @ 2 amperes DC to 60,000 volts @ 45 amperes pulsed from power outputs ranging from microwatts to megawatts and frequencies ranging from 0.5 Ghz to 44 Ghz can be tested on test stations utilizing Automated Test Equipment; this range of capability makes this facility unique within not only the Navy but the entire DoD. Also contributing to its uniqueness is the fully equipped

environmental stress screening facility integrated into the microwave tube test stations. This facility is equipped with a complete Vacuum Processing & Failure Analysis Laboratory providing a unique organic capability to successfully address microwave tube mobilization and surge capabilities, if natural disasters, such as earthquakes, damage major microwave tube suppliers or unexpected world conflicts develop. Crane's microwave tube test and repair facilities are capable of supporting the majority of the DoD requirements while assisting the suppliers in getting their facilities either back on line or increasing their output.

The Microwave Integrated Circuits Test, Evaluation, and Repair Facility provides a unique DoD capability for full spectrum testing and repair of a broad array of microwave solid state devices. The ability to effect repair down to the chip/substrate level on a broad array of microwave solid state devices makes this facility unique.

This facility will also be interconnected with the Crane Division Office Mail system. This will allow managers located in the Model Depot to have virtually instantaneous electronic communication with local customers and with external customers worldwide via Internet and the Defense Data Network.

The facility incorporates Liquid Nitrogen Storage Tanks and Dry Nitrogen into an integrated network of associated piping to allow direct supplying of these resources to the Work Stations. 3 Phase Power of varied cycles, amperage and voltage; and multiple outlets allows flexibility in floor space usage and permits drastic changes in the scope of the work being performed in an area. Compressed Air can piped to Work Stations at up to 120CFM/100PSI via a girded piping system that allows access to all areas of the building. Power Conditioning modulates voltage fluctuations, Uninterruptable Power Source (UPS) protect data, and Phase Protectors protect equipment during Brown Outs.

The Model Depot Facility will be completed in July 1994. It will be the first of its kind within the Navy.

<u>The Ceramic Multilayer Repair Facility</u> -- Serves as the technology base for the Navy. Utilizes expensive system level testers, state of the art repair equipment, extensive environmental testing equipment to conduct environmental stress screening, and replacement part remanufacture to effect repairs. Sophisticated nitrogen ovens are used to produce sample and limited production runs for technology insertion and materials qualification.

<u>The Precision Rotating Components Repair Facility</u> -- Requires stabilization platforms (foundations) for seismic shock/vibration isolation. The equipment/facilities were established over a 30 year period of time beginning in the early sixties. Initial equipment assets were recycled Navy program assets, originally purchased for a prime contractor's development effort. Since that time, numerous equipment additions and upgrades have been funded by a variety of NAVSEA programs. Equipment in most cases is relatively new, but the background knowledge to use them is invested in the people. This facility is the one place in the DOD where the entire overhaul/repair capabilities knowledge base exists. This is the only place that can completely disassemble, repair, and reassemble these mechanical systems.

The Fin Stabilizer Facility -- This is the only facility that can be used for both maintenance and training. The original cost to build was $2.5M and developed incrementally over several years. A maintenance spare for rapid deployment to the fleet is part of test system. The system occupies 7000 cubic feet and weighs 18 ton. This the only place where design improvements and upgrades can be made without incapacitating a ship.
The cost to move this system would be over $50K, and the system could only be moved into a facility that has an overhead crane, 20 ft head clearance, and extensive electronic and mechanical repair capabilities.

OK-276/BQ Series Towed Array Handling System Test Stand - Consisting of the following major components:

a. Test stand

b. Ocean simulator

c. Pump stand

d. Sound proof enclosure.

This equipment is a one of a kind system not available elsewhere in DoD. The test stand system simulates conditions deployed systems undergo while deploying and retrieving submarine towed arrays. No other facilities exist to simulate ocean conditions or operated the system in a true fleet deployed simulation.

There are two TDD range test sets built to test Sidewinder TDDs. Ther is also a LASER Alignment Test Station built for optical alignment of LASER in Sidewinder TDD.

9. Acreage Available for Building

9.1 What acreage on the installation does the government own in the proximity of the depot maintenance area that could be used for future expansion? Identify in the table below the real estate resources which have the potential to facilitate future development and for which you are the plant account holder or into which, though a tenant, your activity could reasonably expect to expand. Developed area is defined as land currently with buildings, roads, and utilities where further development is not possible without demolition of existing improvements. Report in "Restricted" areas that are restricted for future development due to environmental constraints (e.g. wetlands, landfills, archaeological sites), operational restrictions (e.g. ESQD arcs, HERO, HERP, HERF, AICUZ, ranges) or cultural resources restrictions. Identify the reason for the restriction when providing the acreage.

Table 9.1: **Real Estate Resources**

Land Use	Total Acres	Developed Acreage	Available for Development	
			Restricted	Unrestricted
Maintenance	78.7	78.7	0	0
Operational Non-ordnance	722.5	305.0	10.6	406.9
Operational Ordnance	1266.7	768.2	0	498.5
Training	10.4	6.2	0	4.2
R & D	0	0	0	0
Supply & Storage Ordnance	23734.0	17485.6	0	6248.4
Supply & Storage Non-ordnance	1055.2	863.2	0	192
Admin	84.1	76.2	0	7.9
Housing	170.7	45.1	0	125.6
Recreational	675	257	0	418
Navy Forestry Program	48,563	0	44,723	3,840
Navy Agricultural Outlease Program	0	0	0	0
Hunting/Fishing Programs	56,290	0	52,450	3,840
Other (Sub-merged)	900	0	900	0
Total:	62467	19885.2	42581.8	

10. Administrative Space

10.1 What amount in square feet of administrative space could be made available to the depot maintenance function?

Current Use	Square Feet	Potential Use (Be Specific)
Office/Light Industrial	23,040	Office
Office/Industrial	17,304 of 34,608	Office on 2nd Floor
Office/Heavy Industrial	6,052 of 28,203	Office on 2nd and 3rd floor
Office	7,589	Office

11. Industrial Waste

11.1 Are there any inhibiting factors that would limit future expansion on the base? Provide the details if applicable.

Inhibiting Factor — Provide Detailed Description

Water Quality Limits in Receiving Stream - Because receiving stream to which STP discharges has a 7-day 10 low flow of zero, discharge limits are extremely strict. We are currently on the Sec 304(l) list of CWA due to toxic polutant discharge to Boggs Creek. New processes would need to have guaranteed effective wastewater pretreatment in order to assure no further degradation of receiving stream quality. Economic feasibility of providing required degree of treatment could be an inhibiting factor to expansion.

MEASURES OF MERIT

Workload and Capabilities

Answers to the following questions are to reflect programmed amounts by commodity group, by activity in direct labor hours by Fiscal Year for FY 1996 through FY 1999.

12. Core Capabilities (DoD)

12.1 What is the amount of core capability required to support your own Service? Provide your answers in Table 12.1.a by commodity group for the Fiscal Years requested.

Rev 202

Table 12.1.a: **Service Required Core**

COMMODITY GROUP	Capability (DLHs)			
	FY 1996	FY 1997	FY 1998	FY 1999
2.g	164,097	164,856	177,289	208,988
4.a	0	0	0	0
4.b	0	0	0	0
7.e	447	843	843	843
7.f	27300	27300	27300	27300
11.a	3,942	4408	4305	5515
11.b	293,220	293,411	293,365	293,206
14	0	0	0	0
TOTAL	489,006	490,818	503,102	535,852

12. Core Capabilities (DoD), continued

12.2 What is the amount of capability retained for the performance of other Services core? Provide your answers in Table 12.2.a by commodity group for the Fiscal Years requested.

Table 12.2.a: **Core Capability Retained for Other Services**

COMMODITY TYPE	**Capability (DLHs)**				
	F Y 1996	**FY 1997**	**FY 1998**	**FY 1999**	
2.g	14,000	14,000	14,000	14,000	
4.a	0	0	0	0	
4.b	37,800	37,800	37,800	37,800	R
7.e	0	0	0	0	
7.f	58,700	64,700	80,500	80,500	R
11.a	0	0	0	0	
11.b	7,028	7,028	7,028	7,028	
14	0	0	0	0	
TOTAL	117,528	123,528	139,328	139,328	R

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Table 12.1.a: **Service Required Core**

COMMODITY GROUP	Capability (DLHs)			
	FY 1996	FY 1997	FY 1998	FY 1999
2.g	164,097	164,856	177,289	208,988
4.a	0	0	0	0
4.b	0	0	0	0
7.e	447	843	843	843
7.f	27300	27300	27300	27300
11.a	3,942	4408	4305	5515
11.b	293,220	293,411	293,365	293,206
14	0	0	0	0
TOTAL	489,006	490,818	503,102	535,852

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12. Core Capabilities (DoD), continued

12.2 What is the amount of capability retained for the performance of other Services core? Provide your answers in Table 12.2.a by commodity group for the Fiscal Years requested.

Table 12.2.a: **Core Capability Retained for Other Services**

COMMODITY TYPE	**Capability (DLHs)**			
	F Y 1996	**FY 1997**	**FY 1998**	**FY 1999**
2.g	14,000	14,000	14,000	14,000
4.a	0	0	0	0
4.b	75,600	75,600	75,600	75,600
7.e	0	0	0	0
7.f	80,500	80,500	80,500	80,500
11.a	0	0	0	0
11.b	7,028	7,028	7,028	7,028
14	0	0	0	0
TOTAL	177,128	177,128	177,128	177,128

Table 12.1.a: **Service Required Core**

COMMODITY GROUP	Capability (DLHs)			
	FY 1996	FY 1997	FY 1998	FY 1999
2.g	164,097	164,856	177,289	208,988
4.a	0	0	0	0
4.b	0	0	0	0
7.e	447	843	843	843
7.f	27300	27300	27300	27300
11.a	3,942	4408	4305	5515
11.b	293,220	293,411	293,365	239,206
14	0	0	0	0
TOTAL	489,006	490,818	503,102	481,852

12. Core Capabilities (DoD), continued

12.2 What is the amount of capability retained for the performance of other Services core? Provide your answers in Table 12.2.a by commodity group for the Fiscal Years requested.

Table 12.2.a: **Core Capability Retained for Other Services**

COMMODITY TYPE	Capability (DLHs)			
	F Y 1996	FY 1997	FY 1998	FY 1999
2.g	14,000	14,000	14,000	14,000
4.a	0	0	0	0
4.b	75,600	75,600	75,600	75,600
7.e	0	0	0	0
7.f	80,500	80,500	80,500	80,500
11.a	0	0	0	0
11.b	7,028	7,028	7,028	7,028
14	0	0	0	0
TOTAL	177,128	177,128	177,128	177,128

Workload and Capabilities, continued

12. Core Capabilities (DoD), continued

12.3 What portion of the Service Core capability identified in the 12.1a above is identified as Service-Controlled Core (Title 10 responsibility)? Provide your answer in Table 12.3.a by commodity group for the Fiscal Years requested.

Table 12.3.a: **Service-Controlled Core (Title 10)**

COMMODITY GROUP	Capability (DLHs)			
	FY 1996	FY 1997	FY 1998	FY 1999
2.g	164,097	164,856	177,289	208,988
4.a	0	0	0	0
4.b	0	0	0	0
7.e	447	843	843	843
7.f	27300	27300	27300	27300
11.a	3,942	4408	4305	5515
11.b	293,220	293,411	293,365	293,206
14	0	0	0	0
TOTAL	489,006	490,818	503,102	535,852

13. Core Workloads

13.1 What are your total Core Workloads to be applied against capabilities identified in Tables 12.1a and 12.2a)? Provide your answer (DLH) in Table 13.1.a by commodity group for the Fiscal Year requested.

Note: The hours shown reflect only work performed by the Naval Surface Warfare Center. Naval Surface Warfare Center does not have visibility into the total (i.e., public and private) depot maintenance requirement for surface warfare systems.

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Table 13.1a **Total Core Workloads**

COMMODITY GROUP	Workload (DLHs)				
	FY 1996	FY 1997	FY 1998	FY 1999	
2.g	178,097	178,856	191,289	222,988	
4.a	0	0	0	0	
4.b	37,800	37,800	37,800	37,800	R
7.e	447	843	843	843	
7.f	86,000	92,000	107,800	107,800	R
11.a	3,942	4,408	4,305	5,515	
11.b	300,248	300,439	300,393	300,234	
14	0	0	0	0	
TOTAL	606,534	614,346	642,430	675,180	R

14. Other Workloads (Above Core)

14.1 What above core workloads do you perform by these source categories? Use the most appropriate category, but do not duplicate workload on more than one table. Provide answers in Tables 14.1.a through 14.1.g by commodity group for the Fiscal Years requested.

Table 14.1.a: **FMS Above Core Workload**

COMMODITY GROUP	Workload (DLHs)			
	FY 1996	FY 1997	FY 1998	FY 1999
2.g	0	0	0	0
4.a	0	0	0	0
4.b	0	0	0	0
7.e	0	0	0	0
7.f	0	0	0	0
11.a	0	0	0	0
11.b	18,706	19,583	21,355	23,544
14	0	0	0	0
TOTAL	18,706	19,583	21,355	23,544

R (9/29/94)

Revised pg

Table 13.1a **Total Core Workloads**

COMMODITY GROUP	Workload (DLHs)				
	FY 1996	FY 1997	FY 1998	FY 1999	
2.g	178,097	178,856	191,289	222,988	
4.a	0	0	0	0	
4.b	75,600	75,600	75,600	75,600	
7.e	447	843	843	843	
7.f	107,800	107,800	107,800	107,800	
11.a	3,942	4,408	4,305	5,515	
11.b	300,248	300,439	300,393	300,234	R
14	0	0	0	0	
TOTAL	666,134	667,946	680,230	712,980	R

14. Other Workloads (Above Core)

14.1 What above core workloads do you perform by these source categories? Use the most appropriate category, but do not duplicate workload on more than one table. Provide answers in Tables 14.1.a through 14.1.g by commodity group for the Fiscal Years requested.

Table 14.1.a: **FMS Above Core Workload**

COMMODITY GROUP	Workload (DLHs)				
	FY 1996	FY 1997	FY 1998	FY 1999	
2.g	0	0	0	0	
4.a	0	0	0	0	
4.b	0	0	0	0	
7.e	0	0	0	0	
7.f	0	0	0	0	
11.a	0	0	0	0	
11.b	18,706	19,583	21,355	23,544	R
14	0	0	0	0	
TOTAL	18,706	19,583	21,355	23,544	R

Table 13.1a **Total Core Workloads**

COMMODITY GROUP	Workload (DLHs)			
	FY 1996	FY 1997	FY 1998	FY 1999
2.g	178,097	178,856	191,289	222,988
4.a	0	0	0	0
4.b	75,600	75,600	75,600	75,600
7.e	447	843	843	843
7.f	107,800	107,800	107,800	107,800
11.a	3,942	4,408	4,305	5,515
11.b	300,248	300,439	300,393	246,234
14	0	0	0	0
TOTAL	666,134	667,946	680,230	658,980

14. Other Workloads (Above Core)

14.1 What above core workloads do you perform by these source categories? Use the most appropriate category, but do not duplicate workload on more than one table. Provide answers in Tables 14.1.a through 14.1.g by commodity group for the Fiscal Years requested.

Table 14.1.a: **FMS Above Core Workload**

COMMODITY GROUP	Workload (DLHs)			
	FY 1996	FY 1997	FY 1998	FY 1999
2.g	0	0	0	0
4.a	0	0	0	0
4.b	0	0	0	0
7.e	0	0	0	0
7.f	0	0	0	0
11.a	0	0	0	0
11.b	17,705	18,582	20,354	22,543
14	0	0	0	0
TOTAL	17,705	18,582	20,354	22,543

Revised pg

14. Other Workloads (Above Core), continued

Table 14.1.b: **Interservice Above Core Workload**

COMMODITY GROUP	Workload (DLHs)			
	FY 1996	FY 1997	FY 1998	FY 1999
2.g	0	0	0	0
4.a	0	0	0	0
4.b	0	0	0	0
7.e	0	0	0	0
7.f	0	0	0	36,200
11.a	0	0	0	0
11.b	0	0	0	0
14	0	0	0	0
TOTAL	0	0	0	36,200

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Table 14.1.c: **Other Agency Above Core Workload**

COMMODITY GROUP	Workload (DLHs)			
	FY 1996	FY 1997	FY 1998	FY 1999
2.g	0	0	0	0
4.a	0	0	0	0
4.b	0	0	0	0
7.e	0	0	0	0
7.f	0	0	0	0
11.a	0	0	0	0
11.b	0	0	0	0
14	2,500	4,200	4,200	4,200
TOTAL	2,500	4,200	4,200	4,200

14. Other Workloads (Above Core), continued

Table 14.1.b: **Interservice Above Core Workload**

COMMODITY GROUP	Workload (DLHs)			
	FY 1996	FY 1997	FY 1998	FY 1999
2.g	0	0	2,000	5,000
4.a	0	0	0	0
4.b	0	0	0	0
7.e	0	0	0	0
7.f	0	0	0	36,200
11.a	0	0	0	0
11.b	0	0	0	0
14	0	0	0	0
TOTAL	0	0	2,000	41,200

Table 14.1.c: **Other Agency Above Core Workload**

COMMODITY GROUP	Workload (DLHs)			
	FY 1996	FY 1997	FY 1998	FY 1999
2.g	0	0	0	0
4.a	0	0	0	0
4.b	0	0	0	0
7.e	0	0	0	0
7.f	0	0	0	0
11.a	0	0	0	0
11.b	0	0	0	0
14	2,500	4,200	4,200	4,200
TOTAL	2,500	4,200	4,200	4,200

Revised pg

14. Other Workloads (Above Core), continued

Table 14.1.d: **Last Source of Repair Workload**

COMMODITY GROUP	Workload (DLHs)			
	FY 1996	FY 1997	FY 1998	FY 1999
2.g	0	0	0	0
4.a	0	0	0	0
4.b	0	0	0	0
7.e	1,195	3,199	5,599	5,300
7.f	0	0	0	0
11.a	12,573	12,107	5,170	3,960
11.b	34,728	38,994	26,202	44,736
14	0	0	0	0
TOTAL	48,496	54,300	36,971	53,996

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14. Other Workloads (Above Core), continued

Table 14.1.e: **Within Service Above Core Workload**

COMMODITY GROUP	Workload (DLHs)			
	FY 1996	FY 1997	FY 1998	FY 1999
2.g	0	0	0	0
4.a	0	0	0	0
4.b	0	0	0	0
7.f	0	0	0	0
11.a	0	0	0	0
11.b	25,842	22,117	19,187	16,609
14	0	0	0	0
TOTAL	25,842	22,117	19,187	16,609

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14. Other Workloads (Above Core), continued

Table 14.1.d: **Last Source of Repair Workload**

COMMODITY GROUP	Workload (DLHs)			
	FY 1996	FY 1997	FY 1998	FY 1999
2.g	0	0	0	0
4.a	0	0	0	0
4.b	0	0	0	0
7.e	1,195	3,199	5,599	5,300
7.f	0	0	0	0
11.a	12,573	12,107	5,170	8,316
11.b	34,728	38,994	26,202	44,736
14	0	0	0	0
TOTAL	48,496	38,994	36,971	58,352

14. Other Workloads (Above Core), continued

Table 14.1.e: **Within Service Above Core Workload**

COMMODITY GROUP	Workload (DLHs)			
	FY 1996	FY 1997	FY 1998	FY 1999
2.g	0	0	0	0
4.a	0	0	0	0
4.b	0	0	0	0
7.f	0	0	0	0
11.a	0	0	0	0
11.b	25,842	22,117	13,187	16,609
14	0	0	0	0
TOTAL	25,842	22,117	13,187	16,609

14. Other Workloads (Above Core), continued

Table 14.1.f: **Low Quantity Above Core Workload**

COMMODITY GROUP	Workload (DLHs)			
	FY 1996	FY 1997	FY 1998	FY 1999
2.g	0	0	0	0
4.a	0	0	0	0
4.b	0	0	0	0
7.e	203	203	203	203
7.f	0	0	0	0
11.a	325	325	325	325
11.b	0	0	0	0
14	0	0	0	0
TOTAL	528	528	528	528

14. All Other Workloads (Above Core), continued

Table 14.1.g: **All Other Workload (Above Core)**

COMMODITY GROUP	Workload (DLHs)			
	FY 1996	FY 1997	FY 1998	FY 1999
2.g	70,000	71,000	57,000	25,000
4.a	0	0	0	0
4.b	0	0	0	0
7.f	0	0	0	0
11.a	0	0	0	0
11.b	3,923	3,917	3,959	3,939
14	0	0	0	0
TOTAL	73,923	74,917	60,959	28,939

Revised pg

14. Other Workloads (Above Core), continued

Table 14.1.h: **Total Above Core Workload**

(Sum of Tables 14.1.a through 14.1.g)

COMMODITY GROUP	Workload (DLHs)			
	FY 1996	FY 1997	FY 1998	FY 1999
2.g	70,000	71,000	57,000	25,000
4.a	0	0	0	0
4.b	0	0	0	0
7.e	1,398	3,402	5,802	5,503
7.f	0	0	0	36,200
11.a	12,898	12,432	5,495	4,285
11.b	83,199	84,611	70,704	88,829
14	2,500	4,200	4,200	4,200
TOTAL	169,995	175,645	143,201	164,017

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15. Unique and/or Peculiar Workloads (Refer to Question 8.1)

15.1 What amount of the workload reported in question 8.1 is Core? Provide your answer in Table 15.1 by commodity groups for the Fiscal Years requested.

14. Other Workloads (Above Core), continued

Table 14.1.h: **Total Above Core Workload**

(Sum of Tables 14.1.a through 14.1.g)

COMMODITY GROUP	Workload (DLHs)			
	FY 1996	FY 1997	FY 1998	FY 1999
2.g	70,000	71,000	59,000	30,000
4.a	0	0	0	0
4.b	0	0	0	0
7.e	1,398	3,402	5,802	5,503
7.f	0	0	0	36,200
11.a	12,899	12,432	5,495	4,285
11.b	83,199	84,611	70,704	88,829
14	2,500	4,200	4,200	4,200
TOTAL	171,992	177,642	147,199	171,016

15. Unique and/or Peculiar Workloads (Refer to Question 8.1)

15.1 What amount of the workload reported in question 8.1 is Core? Provide your answer in Table 15.1 by commodity groups for the Fiscal Years requested.

Table 15.1: **Unique and/or Peculiar Total Core Workload**

COMMODITY GROUP	Workload (DLHs)			
	FY 1996	FY 1997	FY 1998	FY 1999
2.g	6,691	7,021	7,321	7,471
4.a	0	0	0	0
4.b	75,600	75,600	75,600	75,600
7.e	22	42	42	42
7.f	70,000	77,000	107,000	107,800
11.a	3,125	3,474	3,397	4,305
11.b	133,675	133,686	133,673	133,148
14	0	0	0	0
TOTAL	289,113	296,823	327,033	328,366

15. Unique and/or Peculiar Workloads (Refer to Question 8.1), continued

15.2 What amount of the workload reported in question 8.1 is non-Core? Provide your answer in table 15.2 by commodity group for the Fiscal Years requested.

Table 15.2: **Non-Core Unique and/or Peculiar Workload**

COMMODITY GROUP	Workload (DLHs)				
	FY 1996	FY 1997	FY 1998	FY 1999	
4.a	0	0	0	0	
7.e	70	170	290	275	
7.f	0	0	0	36,200	R
11.a	9,755	9,405	4,202	3,295	
11.b	51,121	57,485	65,156	68,456	R
14	2,500	4,200	4,200	4,200	
TOTAL	63,446	70,260	73,848	112,426	R

Table 15.1: **Unique and/or Peculiar Total Core Workload**

COMMODITY GROUP	Workload (DLHs)			
	FY 1996	FY 1997	FY 1998	FY 1999
2.g	6,691	7,021	7,321	7,471
4.a	0	0	0	0
4.b	75,600	75,600	75,600	75,600
7.e	22	42	42	42
7.f	70,000	77,000	107,000	107,800
11.a	3,125	3,474	3,397	4,305
11.b	133,675	133,686	133,673	133,148
14	0	0	0	0
TOTAL	289,113	296,823	327,033	328,366

15. Unique and/or Peculiar Workloads (Refer to Question 8.1), continued

15.2 What amount of the workload reported in question 8.1 is non-Core? Provide your answer in table 15.2 by commodity group for the Fiscal Years requested.

Table 15.2: **Non-Core Unique and/or Peculiar Workload**

COMMODITY GROUP	Workload (DLHs)			
	FY 1996	FY 1997	FY 1998	FY 1999
4.a	0	0	0	0
7.e	70	170	290	275
11.a	9,755	9,405	4,202	3,295
11.b	38,716	42,016	42,016	45,316
14	2,500	4,200	4,200	4,200
TOTAL	51,041	55,791	50,708	53,086

16. Scope of Work Performed

16.1 Indicate the services/functions performed at this activity that are associated with depot maintenance, but not generally classified or considered as integral to the depot maintenance functions.

Service/Function — Description

Design Engineering, Production Engineering, Acquisition Engineering, In-Service Engineering and Logistics Support for Airborne Electronic Warfare Systems - The Crane Division performs the full life cycle support for fielded airborne electronic warfare systems.

In-Service Engineering and Acquisition Engineering (ISEA/AEA) and Technical Manual Management Agent for Surface Ship Electronic Warfare Systems - The Crane Division provides life cycle support of fielded surface ship electronic warfare systems.

Radar Equipment Engineering; Radar Depot Maintenance Management, Production Engineering and Acquisition Engineering - The Crane Division provides technical experts for review, validation and verification of contractor's technical proposals; provides guidance and recommendations to avoid costly duplication of effort and reduction of costs associated with development, procurement and logistics support.

In-Service Engineering and Acquisition Engineering (ISEA/AEA) for Microwave Tubes - The Crane Division certifies designs, performs qualification and First Artical testing, develops, certifies and approves test procedures, validates producibility, performs sample lot testing, evaluates the performance of tubes in the Fleet, provides microwave tube training to the Fleet and performs engineering investigations.

Navy Night Vision Devices Program Manager - The Crane Division provides policy guidance and decisions on issues of Navy cognizance. The Program Manger helps to maintain stat-of-the-art capability through information exchange on equipment, training, education, technologies, and contacts with key players in the NVEO and scientific communities worldwide.

Navy NVEO In-Service Engineering Agent (ISEA), Acquisition Engineering Agent, Technical Direction Agent (TDA) - Provides technical support and guidance on processes, process improvements, interpretation and/or preparation of supporting documentation. Find and fix equipment or repair problems. Particiaptes as team members on numberous equipement repair process action teams. Assists in reviews and audits, oversees Department Quality Program, performs reverse engineering, investigates alternate sources of equipment and spare parts. Helps integrate upgrade, modification and improvement programs into the repair/maintenance cycle.

Supply Support Functions - The Crane Division Supply Directorate provides material management, material and quipment acquisition and Fleet issue of repaired equipment.

Cable Fabrication - Production of electronic cables and wiring harnesses

Painting - Refinishing and painting

Documentation/drafting - Drawing repository, drafting, and documentation control/accounting

Graphic Arts - Duplication, binding, and distribution of printed matter photography

First Article Test - Evaluation of second source electronic modules

Failure Tracking - Identification of failure trends

Failure Analysis - Scientific investigation of failures

Diminishing Means of Support - Analysis and tracking of obsolescent parts

Evaluation and Upgrade - Life cycle evaluation testing

16.2 Describe how these services/functions are related to accomplishment of the depot maintenance mission, and the benefits of these relationships.

Service/Function Describe Relationship and Benefit to Maintenance Mission

The collocation of these functions delineated in paragraph 16.1 with the Depot provides the opportunity to integrate the information, expertise and experience from all these sources in providing total support to the Fleet and Program Managers. The lessons learned from Fleet operations and failure data from maintenance are rapidly fed back to the engineering groups who provide recommendations for improvement and corrective action effecting ongoing production, new acquisition and upgrades and changes to existing equipment. The logistics support can quickly assess the impact on readiness of any changes considered and support the Program Manager in optimizing the resources available and readiness objectives. This combination provides a synergy and capability impossible to achieve if all of these functions are separate or decentralized. An excellent example of this interaction occurred recently when airborne electronic warfare depot personnel reported a high failure rate of a specific assembly; engineers investigated and quickly found the need for an engineering change; the logisticians assembled the necessary data and the change was approved. The depot then installed the modification during routine repair as units returned to the Depot. This process rapidly transformed an assembly with a mean time to failure of 56 flight hours to an assembly with a mean time to failure of 206 flight hours. Supply functions supporting the Depots are modernized and automated and are centrally located to the depots minimizing internal logistics problems.

All phases of the life cycle of microwave tubes come together at the depot. The only organic facility with equipment for performing the inherently government functions listed above is the depot maintenance activity. These services and functions contribute to reducing maintenance costs through insuring high quality reliable microwave tubes are manufactured and are shipped

to the Fleet. Direct association of the ISEA/AEA with the depot, provides "hands on" involvement of both highly skilled technicians and engineers in the entire life cycle of microwave tubes. This hands-on involvement enhances Crane's role as a "smart buyer" of microwave tubes for the Navy.

Cable Fabrication - Fabrication and modification of system and subassembly wiring harnesses for use during depot maintenance cycle.

Painting - Painting of assemblies/parts for systems, sensors, shipping containers, etc.

Documentation/drafting - Provides documentation control repository services. Drawing generation and reproduction for maintenance procedures, manufacturing data packages, etc.

Graphic Arts - Services include reproduction of maintenance manuals, procedures, etc. Photographic services to support failure analysis.

First Article Test - The Mk-86 depot evaluates first article modules for Navy Ships Parts Control Center, Mechanicsburg, PA. (SPCC). SPCC contracts second source modules to private industry, and relies on the Mk-86 depot to provide objective analysis of the electronic performance, quality, and physical conformance. This provides the fleet and depot with modules that are equivalent to OEM modules. SPCC has confidence that they are purchasing modules that are equivalent and supportable.

Failure Tracking - The Mk-86 depot tracks module failure data by serial number, and identifies the failed part and failure mode. This data is used by the ISEA to identify failure trends and candidates for redesign or engineering change.

Failure Analysis - The Failure Analysis Branch investigates problems from a wide range of customers. Failures may range from the component to the system level. The benefit to the depots is the close proximity of powerful analysis instruments and specialized personnel who can determine why the part failed. This results in lower costs to maintain weapon systems and greater system availability.

Diminishing Means of Support - The Diminishing Means of Support Branch provides an early warning that a part may soon be unavailable due to obsolescence. As parts become obsolete, they identify possible replacement parts, perform circuit redesign, or build new devices under the GEM program. The depots benefit from a secure source of parts. The customer benefits by avoiding modules suddenly becoming non-repairable due to lack of parts.

Evaluation and Upgrade - This allows Crane to offer engineering recommendations to IESA on Mods to the device. This also allows the depot to plan workload and maintenance to be accomplished with maximum efficiency.

17. Interface with Customers

17.1 Indicate any special functions that the depot maintenance function performs that require close interface with customers, such as on-site workloads (e.g. technical assistance, crash/battle damage repairs, modification/upgrade installations).

Service/Function Describe Required Interface/Relationship/Benefit

Both the airborne and surface ship electronic warfare depot staffs, night vision electro-optical depot personnel and radar repair staff work closely with the engineering and logistics groups to provide technical assistance to the Fleet operators and to Fleet Intermediate Maintenance depots. Engineers and technicians have made equipment changes on deployed units to allow countering unexpected specific threats. The Fleet interactions provide excellent opportunities to get first hand information on maintenance problems encountered by Fleet technicians. The surface electronic warfare depot personnel assist Fleet technicians in performing their own repair, alignment and calibration procedures at pierside. This extends the service life of the equipment before return to the depot is required.

Personnel from all repair depots work with engineers to provide training to Fleet technicians in repair of the various equipments and proper handling of the very high cost parts such as microwave tubes and night vision equipment.

During Desert Shield/Desert storm maintenance personnel were sent in-theater to perform urgently needed equipment repairs, provide technical assistance and shipboard installations of night vision, electro-optical equipments.

The installation of upgrades and modifications is done routinely when it provides the most efficient solution for the Program Manager from both cost and schedule perspectives. An excellent example of this was presented in paragraph 16.2 above.

Technical Assistance - Includes on-site equipment repairs, equipment trouble-shooting over the phone, resolution of testing problems and special test requirements. Frequent communication with customers enhances both fleet and depot personnel's knowledge of and requirements for effective system operations. **Loss or failure** of this function **would lead to potential incorrect testing and subsequent degraded in-service system performance.**

Upgrade Installation - On-site upgraded system installations are performed. This interface includes training on the upgraded system capabilities and operation, knowledge of unique test requirements for future system incorporation and providing expected maintenance and reporting requirements to the users. **This service is an important factor to ensure maximum fleet readiness.**

Operator Support - Team with local operators while at sea to assist with repairs/special tests etc. Also provide operators on occasion when the forward sites have schedule conflicts with resident personnel. This involves communicating with ships crew, test directors and other personnel **which results in more capable, better trained forces.**

Refurbishment Cycle Restoration Overhaul Cycle - On going communication with the fleet is required to track usage and equipment condition. Schedules are also coordinated to minimize any impact. This service **provides reliable and dependable equipment to the fleet.**

Casualty Reports (CASREPs) - Provide on-demand fleet support by responding to urgent material requests. This interface is required to ensure exact maintenance requirements are met to return the affected equipment to full operability. This service **provides crucial repair parts to restore system operability.**

The Mk-86 depot is a mature depot and most customer interface consists of workload conferences to determine quarterly workload and repair prices. There is involvement with the ISEA for approval of ECP's and NOR's, and tech assists to the fleet to resolve problems that require a depot's technical perspective.

The SLQ-48 is a depot in transition, and most customer interface is with the ISEA and Program Office. The depot is involved in determining candidates for depot support, identifying capital requirements for depot establishment, developing plans, and performing test development to support depot level repairables.
The Program Office fund the effort, and measures the progress.
The ISEA provides technical expertise and assists the Program Office in evaluating the depot efforts.

The MK-366 depot performs repair on items such as the Weapon's Status - Warning Panel. NSWC Crane also provides Fleet support in the form of technical assists and troubleshooting consultations. A strong interface exists with Fleet officers aboard destroyers in both COMNAVSURFLANT and COMNAVSURFPAC.

The Fin Stabilizer depot provides repairs, SHIPALTs, MACHALTs, and technical assists to the Fleet. NSWC Crane has one of the two test beds available to the Navy. A strong interface exists with Fleet officers aboard FFGs in both COMNAVSURFLANT and COMNAVSURFPAC and in NAVSEA program office.

The MK-34 depot also acts as the ISEA. Modifications and upgrades are performed on board ships during technical assistance visits. Interfacing with Fleet officers is required since the MK-34 is an integral part of the MK-45 5"54 gun system.

The MK-38, 25MM shop builds and installs remote controllers on the Gun Ranges throughout the DOP community. A strong interface with DOP management and the ISEA is required.

MEASURES OF MERIT

Costs [1]

18. Real Property Maintenance (RPM)

18.1 What is your activity's backlog of real property maintenance for facilities performing depot maintenance as of 30 September 1993 (express in $K)?

$1,147

18.2 What were your activity's annual RPM expenses (in $K) for Fiscal Years 1990-1993? Provide your answers in Table 18.2.

Table 18.2: **Real Property Maintenance Expenses**

	FY 1990	FY 1991	FY 1992	FY 1993
RPM Expenses ($K)	439	246	576	73

19. Annual Operating Costs (Excludes Materials used in Depot Maintenance Workloads)

19.1 What were the total depot maintenance actual annual operating costs for your activity (AOC/$K), excluding materials, used in depot maintenance workloads for Fiscal Years 1990-1993? What was the cost per direct labor hour ($DLH) for actual executed hours reported in the DBOF? Provide your answers in Table 19.1.a.

Table 19.1: **Annual Operating Costs**

EXPENSE	FY 1990	FY 1991	FY 1992	FY 1993
AOC ($ K)	8775	27889	30788	33367
$ / DLH	38.99	42.83	49.11	51.02

[1]There are inherent differences in organizational structure and accounting systems across the Services. Consequently, cost accumulations vary considerably. This severely limits the comparability of the cost per direct labor hour ($/DLH) rates across Service lines.

20. Environmental Compliance

20.1 What were your total depot maintenance actual and programmed environmental compliance costs (expressed in $K) for Fiscal Years 1990-1997? Provide your answers in Table 20.1.

Table 20.1: **Environmental Compliance Costs**

COST($K)	FY 1990	FY 1991	FY 1992	FY 1993	FY 1994	FY 1995	FY 1996	FY 1997
Actual	20K	775K	25K	230K	35K	40K	40K	40K
Programmed	0	750	0	200	0	0	0	0

20.2 If spending is accomplished as programmed above, what will be the remaining costs (backlog at the end of Fiscal Year 1997 expressed in $K) to bring existing facilities/equipment into environmental compliance?

None

21. Local Wage Rate

21.1 What were your Department of Labor local wage rates for a WG-11, step 3 for Fiscal Years 1991 through 1994?

Table 21.1: **Wage Rate**

Wage Rate	FY 1991	FY 1992	FY 1993	FY 1994
WG-11 / Step3	14.13	14.72	15.26	15.59

22. Programmed Capital Investments

22.1 How much is programmed for new mission equipment for Fiscal Years 1996 through 1999? Provide your answer (in $K) in Table 22.1.

22.2 How much is programmed for replacement equipment for Fiscal Years 1996 through 1999? Provide your answer (in $K) in Table 22.1.

Table 22.1: **Programmed Capital Investments**

TYPE	FY1996	FY 1997	FY 1998	FY 1999
NEW MISSION ($K)	303	477	402	102
REPLACEMENT ($K)	987	887	902	952

NSWC CRANE DIV
DATA CALL #14

JL
SEA09X
5/12/94

~~I certify that the information contained herein is accurate and complete to the best of my knowledge and belief.~~

~~NEXT ECHELON LEVEL (if applicable)~~

~~NAME (Please type or print~~ ~~Signature~~

~~Title~~ ~~Date~~

~~Activity~~

I certify that the information contained herein is accurate and complete to the best of my knowledge and belief.

NEXT ECHELON LEVEL (if applicable)

RADM (Sel) D. P. Sargent, Jr.
NAME (Please type of print

Signature

Commander
Title

5/11/94
Date

Naval Surface Warfare Center
Activity

In certify that the information herein is accurate and complete to the best of my knowledge and belief.

MAJOR CLAIMANT LEVEL

G. R. STERNER
NAME (Please type or print

Signature

Commander
Naval Sea Systems Command
Activity

5-13-94
Date

I certify that the information contained herein is accurate and complete to the best of my knowledge belief.

DEPUTY CHIEF OF NAVAL OPERATIONS (LOGISTICS)
DEPUTY CHIEF OF STAFF (INSTALLATIONS & LOGISTICS)

J.B. Greene, Jr.
NAME (Please type of print

Signature

Acting
Title

27 May
Date

BRAC-95 CERTIFICATION

Reference: SECNAVNOTE 11000 of 08 December 1993

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I certify that the information contained herein is accurate and complete to the best of my knowledge and belief.

ACTIVITY COMMANDER

S. HOWARD
NAME (Please type or print)

Signature

COMMANDER
Title

6 May 94
Date

CRANE DIVISION
NAVAL SURFACE WARFARE CENTER
Activity

pg 10, 44, 46, 47, 50, 51

DATA CALL # 14
CRANE SITE

I certify that the information contained herein is accurate and complete to the best of my knowledge and belief.

NEXT ECHELON LEVEL (if applicable)

NAME (Please type or print

Signature

Title

Date

Activity

I certify that the information contained herein is accurate and complete to the best of my knowledge and belief.

NEXT ECHELON LEVEL (if applicable)

RADM (Sel) D. P. Sargent, Jr.
NAME (Please type of print

Signature

Commander
Title

8/17/94
Date

Naval Surface Warfare Center
Activity

In certify that the information herein is accurate and complete to the best of my knowledge and belief.

MAJOR CLAIMANT LEVEL

NAME (Please type or print

Signature

8/27/94
Date

G. R. STERNER
Title Commander
Naval Sea Systems Command

Activity

I certify that the information contained herein is accurate and complete to the best of my knowledge belief.

DEPUTY CHIEF OF NAVAL OPERATIONS (LOGISTICS)
DEPUTY CHIEF OF STAFF (INSTALLATIONS & LOGISTICS)

W. A. EARNER
NAME (Please type of print

Signature

9/1/94
Date

Title

Naval Surface Warfare Center
Crane Division
Crane Site
Data Call #14

BRAC-95 CERTIFICATION

Reference: SECNAVNOTE 11000 of 08 December 1993

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I certify that the information contained herein is accurate and complete to the best of my knowledge and belief.

ACTIVITY COMMANDER

S. Howard	
NAME (Please type or print)	Signature
COMMANDER	01 AUG 1994
Title	Date
CRANE DIVISION NAVAL SURFACE WARFARE CENTER	
Activity	

1. Data in Table 2.1 was incorrectly added as thousands instead of millions of dollars and understated the facility replacement value. Also, a math error was found in the equipment row.

2. In Table 12.1.A, the data for commodity ~~12.b~~ 11.b MLP NSWC033 8/22/94 in FY 1999 was entered as 239,206 and should have been 293,206. This entry error resulted in an incorrect summation for commodity ~~12.b~~ 11.b MLP NSWC-033 8/22/94 for FY 1999 in Table 13.1a. This was changed from 246,234 to 300,234.

3. In Table 14.1.a, commodity 11.b was incorrect.

4. In Table 14.1.b, commodity 2.g was incorrect for FY 1998 and FY 1999.

5. In Table 14.1.d, commodity 11.a was incorrect for FY 1999.

6. In Table 14.1.e, commodity 11.b was incorrect for FY1998.

7. In Table 14.1.h, totals are adjusted based on the changes in Tables 14.1.a, b, d and e.

8. In Table 15.2 information for commodity 11.b and commodity 7.f was inadvertently omitted.

Revision DATA CALL #14
CRANE SITE

202

~~I certify that the information contained herein is accurate and complete to the best of my knowledge and belief.~~

~~NEXT ECHELON LEVEL (if applicable)~~

~~NAME (Please type or print~~ ~~Signature~~

~~Title~~ ~~Date~~

~~Activity~~

I certify that the information contained herein is accurate and complete to the best of my knowledge and belief.

NEXT ECHELON LEVEL (if applicable)

RADM (Sel) D. P. Sargent, Jr.
NAME (Please type of print

Signature

Commander
Title

9/7/94
Date

Naval Surface Warfare Center
Activity

In certify that the information herein is accurate and complete to the best of my knowledge and belief.

MAJOR CLAIMANT LEVEL

NAME (Please type or print

Signature

G. R. STERNER
Commander
Title
Naval Sea Systems Command

9-9-94
Date

Activity

I certify that the information contained herein is accurate and complete to the best of my knowledge belief.

DEPUTY CHIEF OF NAVAL OPERATIONS (LOGISTICS)
DEPUTY CHIEF OF STAFF (INSTALLATIONS & LOGISTICS)

J.B. GREENE, JR.
NAME (Please type of print

Signature

ACTING
Title

14 SEP 1994
Date

NAVAL SURFACE WARFARE CENTER
CRANE DIVISION
DATA CALL #14

BRAC-95 CERTIFICATION

Reference: SECNAVNOTE 11000 of 08 December 1993

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I certify that the information contained herein is accurate and complete to the best of my knowledge and belief.

ACTIVITY COMMANDER

J. M. CARNEY
NAME (Please type or print)

Signature

COMMANDER
Title

9/6/94
Date

CRANE DIVISION, NSWC
Activity

Page 5R, Table 1.1.a. The totals have been corrected. In the original submission the computer program automatically included the fiscal year dates in the column headings in the calculations.

Page 7R, Table 1.3.a. The Maximum Potential Capacity for Commodity Group 4.b was revised for each fiscal year.

DATA CALL # 14
CRANE SITE

R

~~I certify that the information contained herein is accurate and complete to the best of my knowledge and belief.~~

~~NEXT ECHELON LEVEL (if applicable)~~

~~NAME (Please type or print)~~ ~~Signature~~

~~Title~~ ~~Date~~

~~Activity~~

I certify that the information contained herein is accurate and complete to the best of my knowledge and belief.

NEXT ECHELON LEVEL (if applicable)

Dr. Ira M. Blatstein
NAME (Please type or print)

Ira M Blatstein
Signature

Technical Director
Title

10/3/94
Date

Naval Surface Warfare Center
Activity

I certify that the information contained herein is accurate and complete to the best of my knowledge and belief.

MAJOR CLAIMANT LEVEL

NAME (Please type or print)
G. R. STERNER

G R Sterner
Signature

Commander
Title Naval Sea Systems Command

10/3/94
Date

Activity

I certify that the information contained herein is accurate and complete to the best of my knowledge and belief.

DEPUTY CHIEF OF NAVAL OPERATIONS (LOGISTICS)
DEPUTY CHIEF OF STAFF (INSTALLATIONS & LOGISTICS)

J. B. GREENE, JR.
NAME (Please type or print)

J B Greene Jr
Signature

ACTING
Title

10 OCT 1994
Date

NAVAL SURFACE WARFARE CENTER
CRANE DIVISION
DATA CALL #14
BRAC-95 CERTIFICATION

Reference: SECNAVNOTE 11000 of 08 December 1993

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I certify that the information contained herein is accurate and complete to the best of my knowledge and belief.

ACTIVITY COMMANDER

B. BAFFORD
NAME (Please type or print)

Signature

MLP
NSWC-033
10-4-94

COMMANDER, (ACTING)
~~EXECUTIVE OFFICER~~
Title

29 SEP 94
Date

CRANE DIVISION, NSWC
Activity

In a phone conversation on 9/29/94, Lt. Col. Bush of the Base Structure Analysis Team questioned the data on Table 12.2.a "Core Capability Retained for Other Services", particularly for commodity groups 4.b (Tactical Missiles) and 7.f (Electro-optics/Night vision). The problem pointed out by Lt. Col. Bush is that the indicated capability retained for the other services exceeds the capacity as indicated in Table 1.1.a.

The explanation is that the Crane managers developed this "core capability" data using the DOD approved methodology to compute core depot maintenance requirements. That methodology resulted in a higher core requirement than Crane currently has capacity to perform.

Lt. Col. Bush indicated that Crane should not cite the requirement but rather the current capacity that is retained. These changes are reflected in the revision being submitted here.

202 R pg. 6

DATA CALL #14
BSAT REVISION
CRANE SITE

~~I certify that the information contained herein is accurate and complete to the best of my knowledge and belief.~~

~~NEXT ECHELON LEVEL (if applicable)~~

~~NAME (Please type or print~~ ~~Signature~~

~~Title~~ ~~Date~~

~~Activity~~

I certify that the information contained herein is accurate and complete to the best of my knowledge and belief.

NEXT ECHELON LEVEL (if applicable)

RADM (Sel) D. P. Sargent, Jr.
NAME (Please type of print

Signature

Commander
Title

9/14/94
Date

Naval Surface Warfare Center
Activity

In certify that the information herein is accurate and complete to the best of my knowledge and belief.

MAJOR CLAIMANT LEVEL

NAME (Please type or print
G. R. STERNER
Commander
Naval Sea Systems Command
Title

Signature

9-22-94
Date

Activity

I certify that the information contained herein is accurate and complete to the best of my knowledge belief.

DEPUTY CHIEF OF NAVAL OPERATIONS (LOGISTICS)
DEPUTY CHIEF OF STAFF (INSTALLATIONS & LOGISTICS)

NAME (Please type of print

Signature

Title

10/1/94
Date

NAVAL SURFACE WARFARE CENTER
CRANE DIVISION
DATA CALL #14

BRAC-95 CERTIFICATION

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ACTIVITY COMMANDER

J. M. CARNEY
NAME (Please type or print)

Signature

COMMANDER
Title

9/7/94
Date

CRANE DIVISION, NSWC
Activity

1. As per the BSAT request for clarification on 7 Sept. 94, Table 1.2.a (Utilization Index) is revised to express the weighted utilization index across all commodity groups.

202 R. pg 5

DATA CALL #14
CRANE SITE

~~I certify that the information contained herein is accurate and complete to the best of my knowledge and belief.~~

~~NEXT ECHELON LEVEL (if applicable)~~

~~NAME (Please type or print~~ ~~Signature~~

~~Title~~ ~~Date~~

~~Activity~~

I certify that the information contained herein is accurate and complete to the best of my knowledge and belief.

NEXT ECHELON LEVEL (if applicable)

RADM (Sel) D. P. Sargent, Jr.
NAME (Please type of print

Signature

Commander
Title

9/14/94
Date

Naval Surface Warfare Center
Activity

In certify that the information herein is accurate and complete to the best of my knowledge and belief.

MAJOR CLAIMANT LEVEL

NAME (Please type or print
G. R. STERNER
Commander
Title Naval Sea Systems Command

Signature

9-22-94
Date

Activity

I certify that the information contained herein is accurate and complete to the best of my knowledge belief.

DEPUTY CHIEF OF NAVAL OPERATIONS (LOGISTICS)
DEPUTY CHIEF OF STAFF (INSTALLATIONS & LOGISTICS)

NAME (Please type of print

Signature

Title

10/1/94
Date

NAVAL SURFACE WARFARE CENTER
CRANE DIVISION
DATA CALL #14

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ACTIVITY COMMANDER

J. M. CARNEY
NAME (Please type or print)

J M Carney
Signature

COMMANDER
Title

9/12/94
Date

CRANE DIVISION, NSWC
Activity

Page 5R, Table 1.1.a. DLHs for FY 1997 for Commodity Group 4.b corrected. The total for FY 1997 revised to reflect this change.

202 R 7 6, 11

~~I certify that the information contained herein is accurate and complete to the best of my knowledge and belief.~~

~~NEXT ECHELON LEVEL (if applicable)~~

~~NAME (Please type or print)~~ ~~Signature~~

~~Title~~ ~~Date~~

~~Activity~~

I certify that the information contained herein is accurate and complete to the best of my knowledge and belief.

NEXT ECHELON LEVEL (if applicable)

Dr. Ira M. Blatstein
NAME (Please type or print)

Ira M Blatstein
Signature

Technical Director
Title

10/26/94
Date

Naval Surface Warfare Center
Activity

I certify that the information contained herein is accurate and complete to the best of my knowledge and belief.

MAJOR CLAIMANT LEVEL

NAME (Please type or print)

G R Sterner
Signature

G. R. STERNER
Title Commander
Naval Sea Systems Command

10/26/94
Date

Activity

I certify that the information contained herein is accurate and complete to the best of my knowledge and belief.

DEPUTY CHIEF OF NAVAL OPERATIONS (LOGISTICS)
DEPUTY CHIEF OF STAFF (INSTALLATIONS & LOGISTICS)

NAME (Please type or print)

W Bauer
Signature

Title

10/27/94
Date

DATA CALL #14
BSAT CLARIFICATION
CRANE

NAVAL SURFACE WARFARE CENTER
CRANE DIVISION
DATA CALL #14
BRAC-95 CERTIFICATION

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ACTIVITY COMMANDER

J. M. CARNEY	J M Carney
NAME (Please type or print)	Signature
COMMANDER	10/24/94
Title	Date
CRANE DIVISION, NSWC	
Activity	

1. GUIDANCE - The Crane Division received a FAX transmission on 13 October 94 reporting a "mismatch" in our depot workload tables in Data Call #14. After review of our data and several phone conversations, we could not find a rational for change. On 20 October 94 the Crane Division received written guidance from the Base Structure Analysis Team which stated that: "the sum of Core Workload (Table 13.1) and Above Core Workload (Table 14.1.h) should add up to Programmed Workload (Table 3.1.b)". This revision changes the Programmed Workload to agree with this equation.

2. ORIGINAL RESPONSE - Our original response was based on an interpretation that "Programmed Workload" was our best estimate of future work. "Programmed Workload" is a misnomer to us in that our repair workload is not scheduled maintenance tied to a ship overhaul schedule and is not "programmed" into the POM . Rather, the majority of our depot work is repair of subsystems, circuit cards, and components after they fail and are returned. The original response was a prediction developed using factors such as: a system retirement schedule; any new start-up; and our historical experience.

3. OTHER TABLES - The modification of Programmed Workload carries over to other tables. Programmed Workload ($) Table 3.1.a and Utilization Index (Table 1.2.a) were also modified.