

# Definition and Scope (1 of 2)

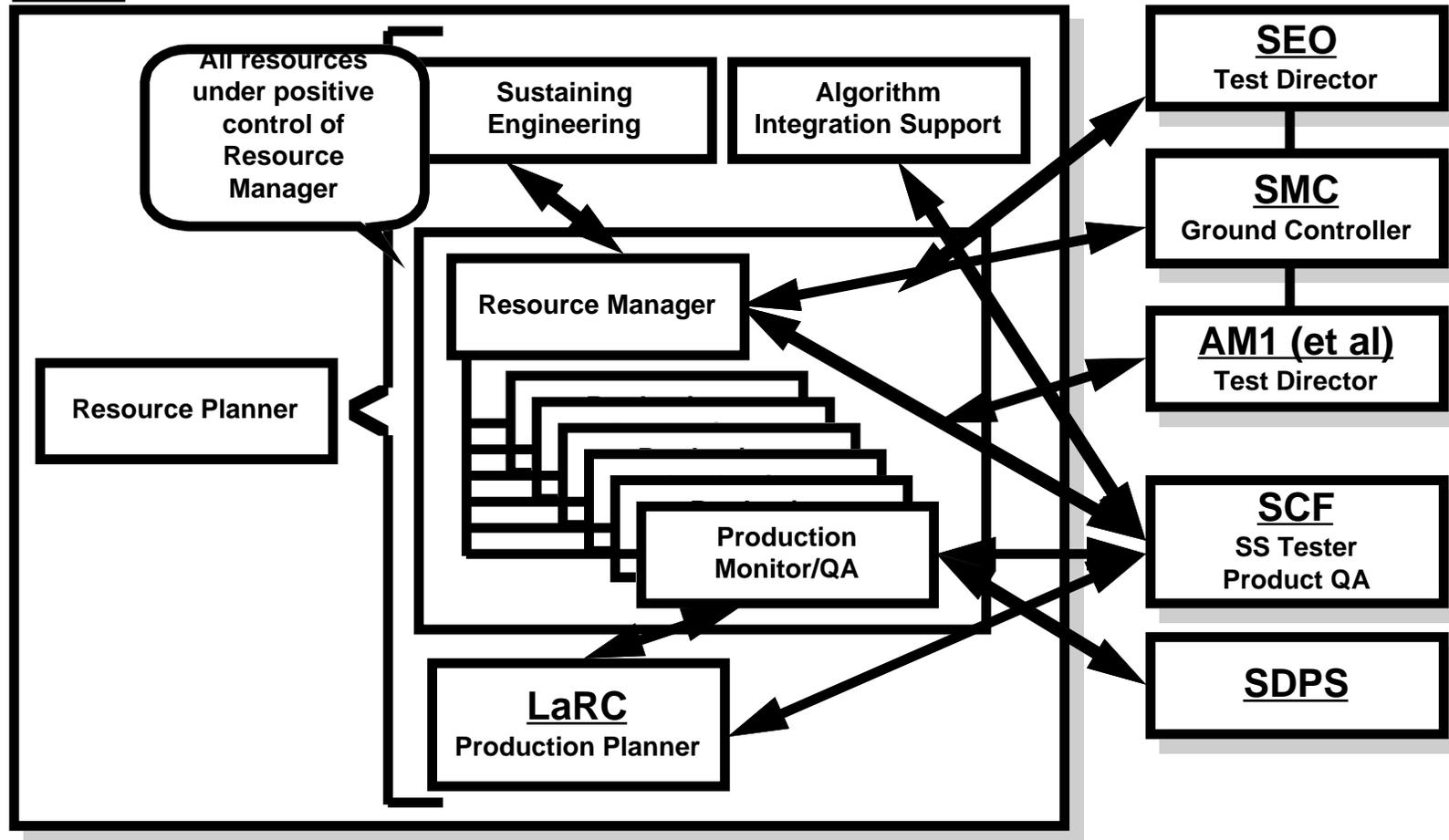
- **23-Feb-98, ECS Management and Engineering at LaRC:**
  - **Management review meetings**
  - **Sustaining engineering**
    - » **System engineering**
    - » **SW engineering**
    - » **Testing**
  - **Configuration management**
  - **Algorithm integration support**
  - **Resource Planner/Performance Analysis**
  - **Property management/ILS**
  - **User services**
  - **Data base administration**

# Definition and Scope (2 of 2)

- **23-Feb-98, ECS Operations at LaRC:**
  - Operations supervision
  - Production planning and scheduling
  - Product generation
  - Resource management
  - Data ingest and distribution
  - Archive/data server management
  - System administration/computer operations
  - Hardware maintenance
  - V0 data migration

# Operational Organizational I/Fs

## LaRC



# Selected Roles and Responsibilities for Scenario (1 of 8)

- **LaRC DAAC ECS Personnel**

- **Sustaining Engineering**

- » Perform LaRC DAAC local test
    - » Support SEO system-wide test
    - » Support EOS-AM1 Release B test

- **Algorithm Integration**

- » Provide on-site Science Tool Kit expertise and support to DAAC Scientist / Science Support Teams in the test and integration of science S/W (both updates and new S/W) into the ECS system
    - » Provide support to DAAC Scientist, Science Support Teams and the Instrument Team scientists in the development and integration of algorithms (science S/W) for both updates and new algorithms into the ECS system. In accordance with SCF policy, provide science production QA and problem resolution with the SCF. Support USO in responding to highly technical user assistance requests.

# **Selected Roles and Responsibilities for Scenario (2 of 8)**

- **LaRC DAAC ECS Personnel (continued)**
  - **Resource Planner**
    - » **Coordinate ECS resource utilization with Sustaining Engineering, SMC, SCF, and other authorized users**
    - » **Build and manage resource plan**
  - **Production Planner/Scheduler**
    - » **Develop rolling 30 day plan once every two weeks**
    - » **Develop rolling 10 day detailed plan each week**

# **Selected Roles and Responsibilities for Scenario (3 of 8)**

- **LaRC DAAC ECS Personnel (continued)**
  - **Resource Manager**
    - » **On-line management of operational resources**
    - » **Configure operational resources in accordance with approved resource schedule and operational resource baseline**
    - » **Re-configure in response to utilization requirements, changes and anomalies.**
    - » **Monitor, manage and control the local area network and system**
    - » **Take corrective action to respond to anomalies**
    - » **Coordinate with SMC**
    - » **Assist in diagnosis and isolation of hardware and software problems**
    - » **Maintain system configuration tables**
    - » **Monitor and report on resources performance to management.**

# **Selected Roles and Responsibilities for Scenario (4 of 8)**

- **LaRC DAAC ECS Personnel (continued)**
  - **Operations/Production Monitor**
    - » **Manage processing queues**
    - » **Monitor Data Processing Request execution status**
    - » **Manage / optimize production resource utilization**
    - » **Monitor quality and completeness of input and output using science software provided QA tools**
    - » **Provide production reports.**
  - **Ingest/Distribution Technician**
    - » **Receive, log, ingest and disposition all incoming non-electronic media**
    - » **Monitor electronic and manual ingest of data. Coordinate with sender to resolve any ingest problems**
    - » **Monitor electronic and perform physical distribution of data.**
    - » **Load / unload media from write devices, assemble "data packages", package, label, and ship output to science users. Follow up and trace undelivered output**
    - » **Receive, open, and route incoming mail to appropriate action department.**

# Selected Roles and Responsibilities for Scenario (5 of 8)

- **LaRC DAAC ECS Personnel (continued)**

- **Archive Manager**

- » **Manage input, storage and output of science data**
    - » **Manage ingest data server(s) and archive, ensuring data is made available for use in science production operations, to fill user requests and that data is successfully archived**
    - » **Oversee ingest and distribution functions**
    - » **Ensure the successful backup of science data**
    - » **Perform periodic media sampling and refresh as required and periodic preventive maintenance of archive media**
    - » **Establish and maintain data server and ingest-archive-retrieval subsystem configurations**
    - » **Status and report on ingest-archive-retrieval subsystem performance.**

# Selected Roles and Responsibilities for Scenario (6 of 8)

- **LaRC DAAC ECS Personnel (continued)**
  - **System Administrator/Computer Operator**
    - » Operate the host processors, support restarts/reboots, configure / re-configure resources as directed, monitor system status, respond to console messages and do initial program loads for all system upgrades
    - » Perform minor housekeeping maintenance, system back-up and recovery operator level preventive maintenance and problem diagnosis and recovery
    - » Administer the networked workstations supporting the M&O staff.
  - **Hardware Maintenance**
    - » Coordinate/provide maintenance of ECS hardware
    - » Manage operations expendables (e.g., hard media, paper, ...)
  - **V0 Data Migration**
    - » Execute and monitor SW that migrates data from V0 to ECS
    - » Provide production quality assurance that migration SW properly executed

# Selected Roles and Responsibilities for Scenario (7 of 8)

- **SMC**
  - **Ground Controller**
    - » Coordinate system-wide testing with Resource Manager
    - » Monitor system performance
    - » Support fault isolation between and among the DAACs, communications networks, SCFs, users, etc.
- **SEO**
  - **Test Director**
    - » Develop detailed test plans and procedures for ECS system-wide testing
    - » Coordinate and monitor execution of tests
- **AM1**
  - **Test Director**
    - » Develop detailed test plans and procedures for ECS AM1 Release B test
    - » Coordinate and monitor execution of tests

# Selected Roles and Responsibilities for Scenario (8 of 8)

- **SCF**
  - **QA**
    - » Provide product QA on CERES products
  - **Test Director**
    - » Develop detailed test plans and procedures for CERES science SW test
    - » Coordinate, execute and monitor test

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**Day in the Life  
LaRC DAAC  
Monday, 23-Feb-98**

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# LaRC Prologue

- **LaRC DAAC, Monday, 23-Feb-98, 7:00 AM**
- **5 days/week, 8 hours/day**
  - Management and engineering
  - User services
  - Algorithm integration support
  - Data ingest/distribution
- **7 days/week, 16 hours/day**
  - CERES standard product generation ongoing
  - V0 data migration ongoing
- **Yesterday**
  - Network problems slowed planned product generation and data distribution

# Monday, 23-Feb-98, LaRC DAAC

## ECS Engineering Activities

Slide A	AM					PM											
	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11
Management & Administration		A1		A2		A3											
Sustaining Engineering		A1	A3	A2			A4		A3	A5	A7						
Config. Mgt. Administrator				A2		A3											
Algorithm Integrator						A3		A6									
Resource Planner/ Performance Analysis		A1		A2		A3											
Property Management/ Integ. Log. Support				A2		A3											
User Services**		A1		A2		A3											
Data Base Administrator				A2		A3											
Production Planner/ Scheduler						A3											

\*\* User Services performed by DAAC personnel

# **Monday, 23-Feb-98, LaRC DAAC**

## **ECS Engineering Activities**

### **Management, Science Support and Engineering:**

- A1. Review weekend activities and planned Monday activities at *LaRC Daily Operations Review* meeting**
- A2. Review weekly maintenance and operations activities *LaRC M&O Weekly Review* meeting**
- A3. Perform daily engineering & management tasks**
- A4. Perform LaRC Sustaining Engineering SW testing**
- A5. Support GSFC Sustaining Engineering Organization (SEO) system testing**
- A6. Support CERES Science SW testing**
- A7. Support AM1 interface testing**

# Monday, 23-Feb-98, LaRC DAAC

## ECS Operations Activities

Slide B	AM					PM											AM		
	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1
Operations Supervisor		B1A 1		A2	B2														
Production Monitor/QA					B3				A6			A7		B3					
Resource Manager		B1A 1		A2	B4				B9	A5		A7		B4					B4u
Ingest/ Distribution Technician					B5										B5u				
Archive Manager					B6		A4		B9			A7		B6	B10				B8u
System Administrator/ Computer Operator					B7				B9					B7					
Hardware Maintenance					B8				B9					B8	B10				
V0 Data Migration					B11										B11u				

# **Monday, 23-Feb-98, LaRC DAAC**

## **ECS Operations Activities (1 of 3)**

### **Operations Supervisor:**

- B1. Data collection, vu-graph generation**
- B2. Daily engineering & management tasks**

# Monday, 23-Feb-98, LaRC DAAC

## ECS Operations Activities (2 of 3)

### Operations Crew:

- B3.** First and second shift, production monitoring and QA
- B4.** First and second shift, resource management
- B4u.** Unattended LSM data collection
- B5.** First shift, data ingest and distribution
- B5u.** Unattended data ingest and distribution operations
- B6.** First and second shift, archive management
- B6u.** Unattended data server & archive operations
- B7.** First and second shift, system administration & computer operations
- B8.** First and second shift, hardware maintenance
- B9.** First and second shift overlap

# **Monday, 23-Feb-98, LaRC DAAC**

## **ECS Operations Activities (3 of 3)**

### **Operations Crew (continued):**

- B10. Archive HW maintenance period**
- B11. First shift V0 data migration operations**
- B11u. Unattended V0 data migration operations**

# Monday, 23-Feb-98, LaRC DAAC

## First Shift ECS Operations Activities

Slide C	AM											PM																	
	7			8			9			10			11			12			1			2			3			4	
Sustaining Engineering				A1					A2						A3	C27	A4	C28	C29									A5	C30
Production Monitor/QA Operator	C7											B3												A	B9			B3	C10
Resource Manager	C11	B4	B1	A1	B4			A2							C12	B4	C13	C14							C9			A5	B4
Ingest/ Distribution Technician												B5																	B5u
Archive Manager	C16		C17						C17			B6				C18	A4								B9			B6	
System Administrator/ Computer Operator									C20							C21		C22	C23						B9		C24	C25	B7
Hardware Maintenance												B8						C26							B9			B8	
V0 Data Migration	C31											B11																B11u	

# **Monday, 23-Feb-98, LaRC DAAC**

## **First Shift ECS Operations Activities (1 of 6)**

### **Production Monitor/QA Operator:**

**C1-C6. Not used**

**C7. Review today's plan, have RM configure product generation HW & SW in accordance with today's plan.**

**C8. Coordinate with Resource Manager on use of product generation resources for CERES testing (see C13); approve release of resources to CERES SW test team**

**C9. At shift change, operator briefs the second shift operator on the daily plan and its status, configuration of the resources, including expected return of test resources, etc.**

**C10. Coordinate return of resources from test to operations with Resource Manager**

# **Monday, 23-Feb-98, LaRC DAAC**

## **First Shift ECS Operations Activities (2 of 6)**

### **Resource Manager:**

- C9. At shift change, operator briefs the second shift operator on the daily plan and its status, configuration of the resources, including expected return of test resources, etc.**
- C11. Review today's resource usage plan, configure resources to begin product generation operations, coordinate with SMC to return monitoring function to LaRC**
- C12. Coordinate use of data server resources by LaRC Sustaining Engineering with Archive Manager (see C18) and test team (see C27); after Archive Manager approval, configure resources**
- C13. Coordinate use of product generation resources by CERES Science team with Production Monitor (see C8); after Production Monitor approval, configure resources**

# **Monday, 23-Feb-98, LaRC DAAC**

## **First Shift ECS Operations Activities (3 of 6)**

### **Resource Manager (continued):**

- C14. Coordinate return of data server resources with Archive Manager (see C19) and test team (see C29); after Archive Manager approval, configure resources**
- C15. Via telephone, coordinate use of local system manager (LSM) resources by GSFC SEO test team; configure resources**

# **Monday, 23-Feb-98, LaRC DAAC**

## **First Shift ECS Operations Activities (4 of 6)**

### **Archive Manager**

- C16. Review today's plan, have RM configure data server/archive HW & SW in accordance with today's plan**
- C17. Monitor Resource Manager's displays and alarms while RM is off of the operations floor**
- C18. Coordinate use of data server resources by LaRC Sustaining Engineering with Resource Manager (see C12); approve release of resources**
- C19. Coordinate return of data server resources with Resource Manager and test team (see C14); approve return of resources**

# **Monday, 23-Feb-98, LaRC DAAC**

## **First Shift ECS Operations Activities (5 of 6)**

### **System Administrator/Computer Operator:**

- C20. Assist Ingest/Distribution Technician in generation and packaging of physical media**
- C21. Assist LaRC test team by mounting removable media**
- C22. Assist CERES test team by mounting removable media**
- C23. Assist LaRC test team by dismounting removable media**
- C24. Assist CERES test team by dismounting removable media**
- C25. Initiate daily backup of part of system**

### **Hardware Maintainer**

- C26. Pull extra archive media from inventory for later loading**

# **Monday, 23-Feb-98, LaRC DAAC**

## **First Shift ECS Operations Activities (6 of 6)**

### **V0 Data Migration**

- C31. Review unattended data migration results; work with production planner/scheduler to modify day's plan**

### **Sustaining Engineering:**

- C27. Coordinate test resource usage with Resource Manager; provide mountable media to System Administrator/Computer Operator**
- C28. Conduct testing. Capture test results.**
- C29. Have System Administrator/Computer Operator dismount removable media; coordinate with Resource Manager for return of test resources**
- C30. Support GSFC SEO organization testing as required**

# Monday, 23-Feb-98, LaRC DAAC

## Second Shift ECS Operations Activities

Slide D	PM												AM
	3	4	5	6	7	8	9	10	11	12			
Sustaining Engineering		A5 C20 D1		A7 D2		D3							
Production Monitor/QA	B9 C9	C10	D4	D5	D6	B3				D7			
Resource Manager	C9 C15	A5 D13	D8	A7 D9	D10	B4	D11		D12	D13	B4u		
Ingest/ Distribution Technician	B5	D14					B5u						
Archive Manager	B9		D4	A7 D5	D6	B6	D15	B10	D16	D14	B6u		
System Administrator/ Computer Operator	B9	C24 C25	D17		D18	B7							
Hardware Maintenance	B9					B8	D19	B10 D20	D21				
V0 Data Migration	B11	D14					B11u						

# **Monday, 23-Feb-98, LaRC DAAC**

## **Second Shift ECS Operations Activities (1 of 8)**

### **Sustaining Engineering:**

- D1. Attend pre-test meeting/telecon; review resource requirements; coordinate resource requirements with operations crew**
- D2. Observe testing; fill in at operational positions as needed; create test log and Discrepancy Reports as required**
- D3. Capture test results and data; attend post-test meeting/telecon. Review discrepancy reports with test team**

# **Monday, 23-Feb-98, LaRC DAAC**

## **Second Shift ECS Operations Activities (2 of 8)**

### **Production Monitor/QA Operator:**

- D4. Coordinate with Resource Manager on use of Release B product generation resources for AM1 testing (see D8); approve release of resources to test team.**
- D5. Execute test procedures on Release B resources; monitor both test and TRMM/CERES Release A resource performance**
- D6. Coordinate return of Release B resources from test to operations with Resource Manager**
- D7. Coordinate with Resource Manager to configure Release A product generation resources for nightly shutdown**

# **Monday, 23-Feb-98, LaRC DAAC**

## **Second Shift ECS Operations Activities (3 of 8)**

### **Resource Manager:**

- D8. Coordinate with Production Monitor/QA Operator and Archive Manager on use of Release B resources for AM1 testing; after other operator's approval, configure Release B resources**
- D9. Monitor performance of test resources while also monitoring operational resources**
- D10. Coordinate return of Release B resources from testing with other operators and testing personnel; configure resources**
- D11. Coordinate with Archive Manager (see D15) and Hardware Maintainer (see D19) on performance of HW maintenance on archive robotics; configure resources after Archive Manager approval**

# **Monday, 23-Feb-98, LaRC DAAC**

## **Second Shift ECS Operations Activities (4 of 8)**

### **Resource Manager (continued):**

- D12. Coordinate with Archive Manager (see D16) and Hardware Maintainer (see D20) at completion of HW maintenance on archive robotics; configure resources after Archive Manager approval to return to operations**
- D13. Coordinate with Production Monitor on nightly shutdown of product generation resources. Coordinate with V0 Data Migration, Ingest/Distribution Technician and Archive Manager on unattended operations. Coordinate with SMC on remote monitoring of LaRC unattended resources after crew leaves; configure resources**

# **Monday, 23-Feb-98, LaRC DAAC**

## **Second Shift ECS Operations Activities (5 of 8)**

### **Ingest/Distribution Technician:**

- D14. Coordinate with Resource Manager to configure ingest resources for unattended operations**

# **Monday, 23-Feb-98, LaRC DAAC**

## **Second Shift ECS Operations Activities (6 of 8)**

### **Archive Manager:**

- D4. Coordinate with Resource Manager on use of archive resources for AM1 testing (see D8); approve release of resources to test team.**
- D5. Execute test procedures; monitor test resource performance**
- D6. Coordinate return of resources from test to operations with Resource Manager**
- D14. Coordinate with Resource Manager to configure product generation resources for unattended operations**
- D15. Coordinate with Resource Manager (see D11) on performance of HW maintenance on archive robotics; approve transfer of archive robotics from operations to maintenance**
- D16. Coordinate with Resource Manager (see D12) at completion of HW maintenance on archive robotics; accept transfer of archive robotics from maintenance to operations**

# **Monday, 23-Feb-98, LaRC DAAC**

## **Second Shift ECS Operations Activities (7 of 8)**

### **Archive Manager (continued):**

- D15. Coordinate with Resource Manager (see D11) on performance of HW maintenance on archive robotics; approve transfer of archive robotics from operations to maintenance**
- D16. Coordinate with Resource Manager (see D12) at completion of HW maintenance on archive robotics; accept transfer of archive robotics from maintenance to operations**

# **Monday, 23-Feb-98, LaRC DAAC**

## **Second Shift ECS Operations Activities (8 of 8)**

### **System Administrator/Computer Operator:**

- D17. Assist AM1 test team by mounting removable media on Release B resources**
- D18. Assist AM1 test team by dismounting removable media from Release B resources**

### **Hardware Maintainer:**

- D19. Coordinate with Resource Manager (see D11) on performance of HW maintenance on archive robotics.**
- D20. Perform HW maintenance including loading of new media**
- D21. Coordinate with Resource Manager (see D12) at completion of HW maintenance on archive robotics**

### **V0 Data Migration:**

- D14. Coordinate with Resource Manager for unattended V0 data migration operations**

# Monday, 23-Feb-98, LaRC DAAC

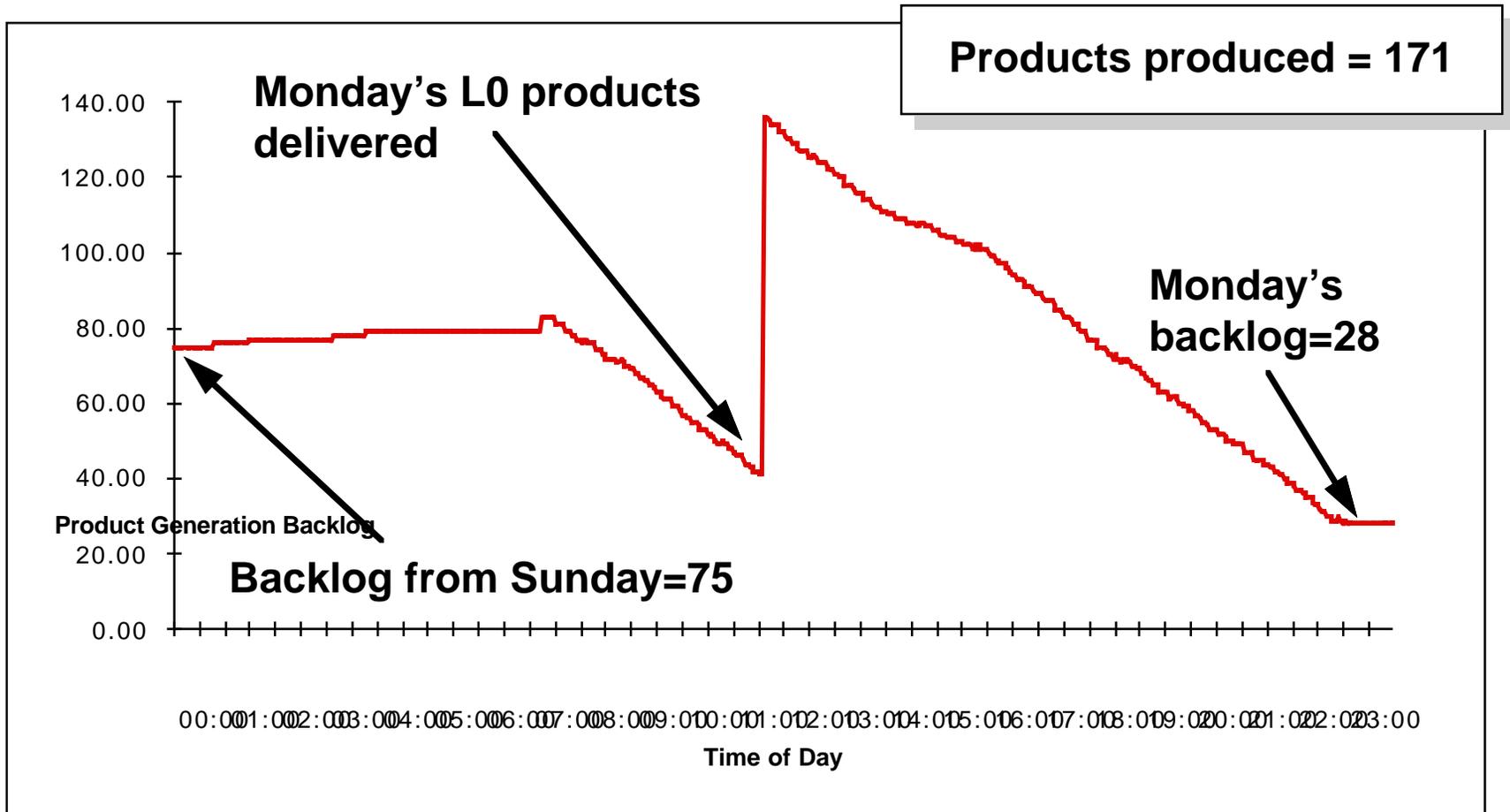
## Production Monitor/QA

- **Today's product generation plan (from AHWGP data):**

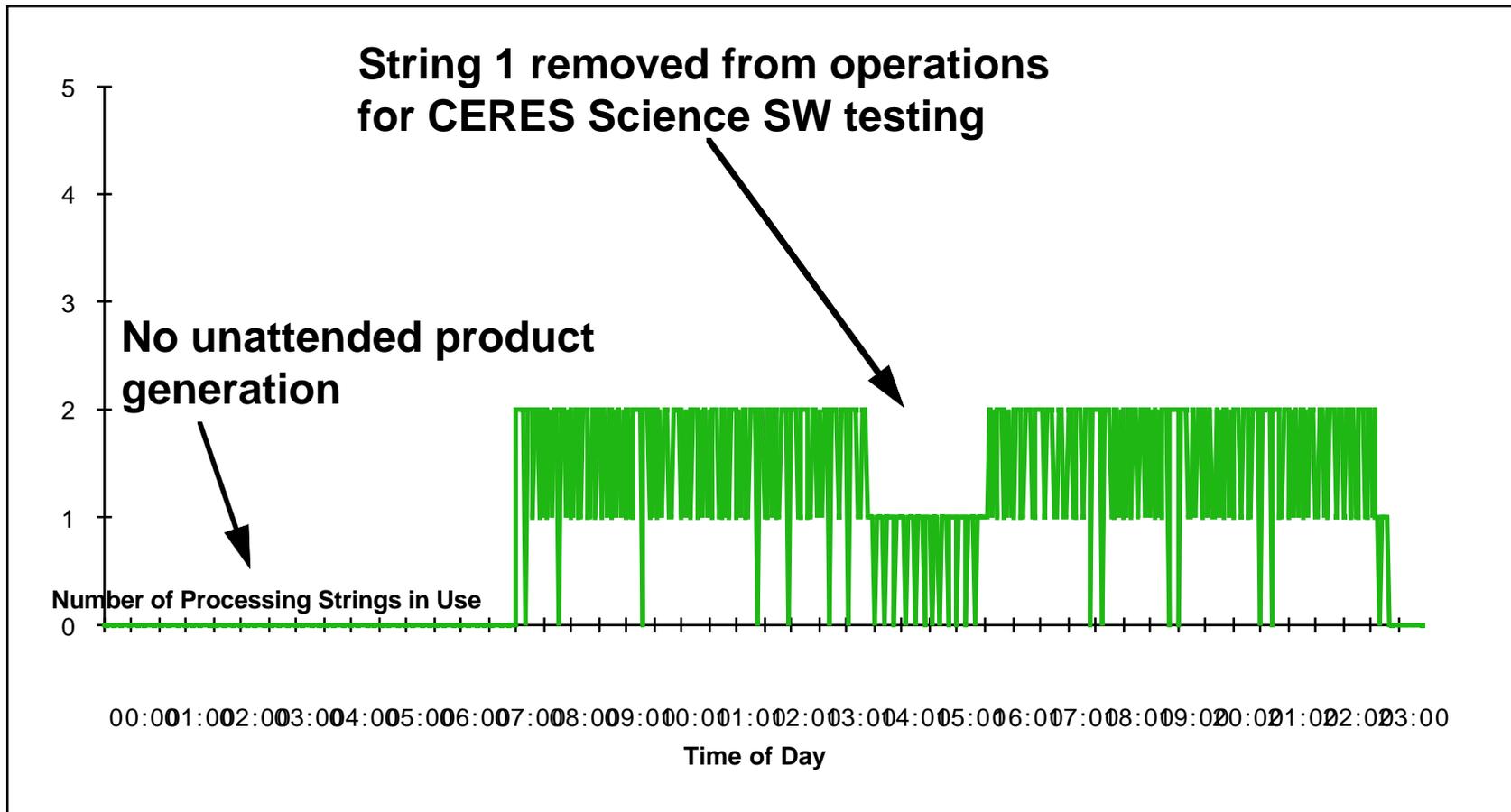
– Hourly products	4 products	96 today
– Daily products	3 products	3 today
– Once every five days	1 product	
– Once every 10 days	1 product	
– Monthly products	6 products	
- **Backlog jobs from Sunday:** **75**
- **Average # of ad hoc jobs during 24 hr period:** **20**
- **Average run time of a job at 1x:** **00:09:00**
- **Run time variability:** **+ or - 00:05:00**
- **Processing capacity each string:** **0.9x**

# Monday, 23-Feb-98, LaRC DAAC

## Product Generation Queue



# Monday, 23-Feb-98, LaRC DAAC Production Strings Utilization



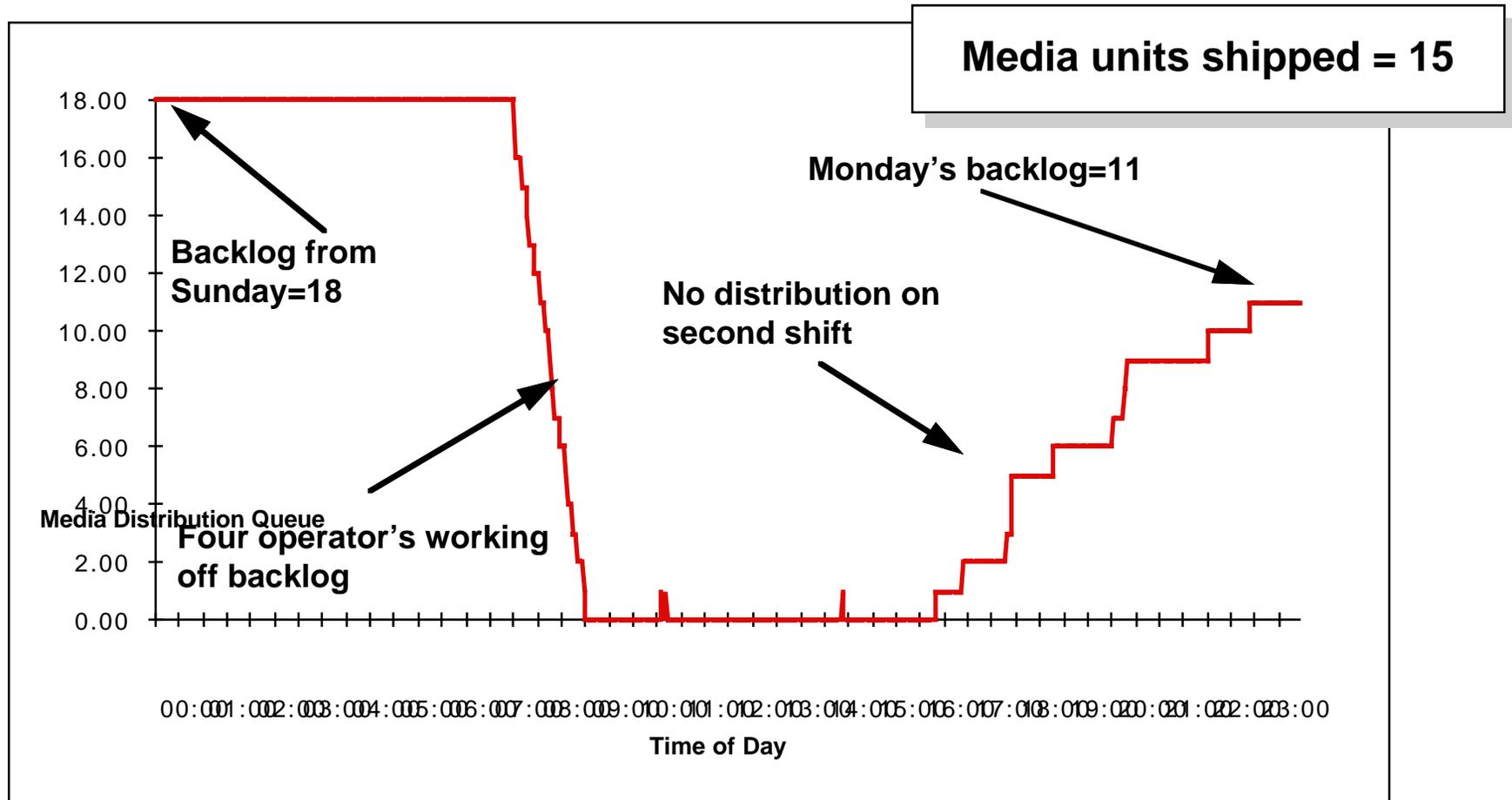
# Monday, 23-Feb-98, LaRC DAAC

## 10% Hard Media Data Distribution

- **% of data distributed via hard media:** **10%**
- **Backlog jobs from Sunday:** **18**
- **Avg time to build and prepare media:** **00:12:00**
- **Job time variability:** **00:06:00**
- **Productivity of each of 3 Data I/D Techs.:** **0.75**
- **Productivity of Sys. Admin/Comp. Oper.:** **0.50**

# Monday, 23-Feb-98, LaRC DAAC

## 10% Hard Media Data Distribution Backlog



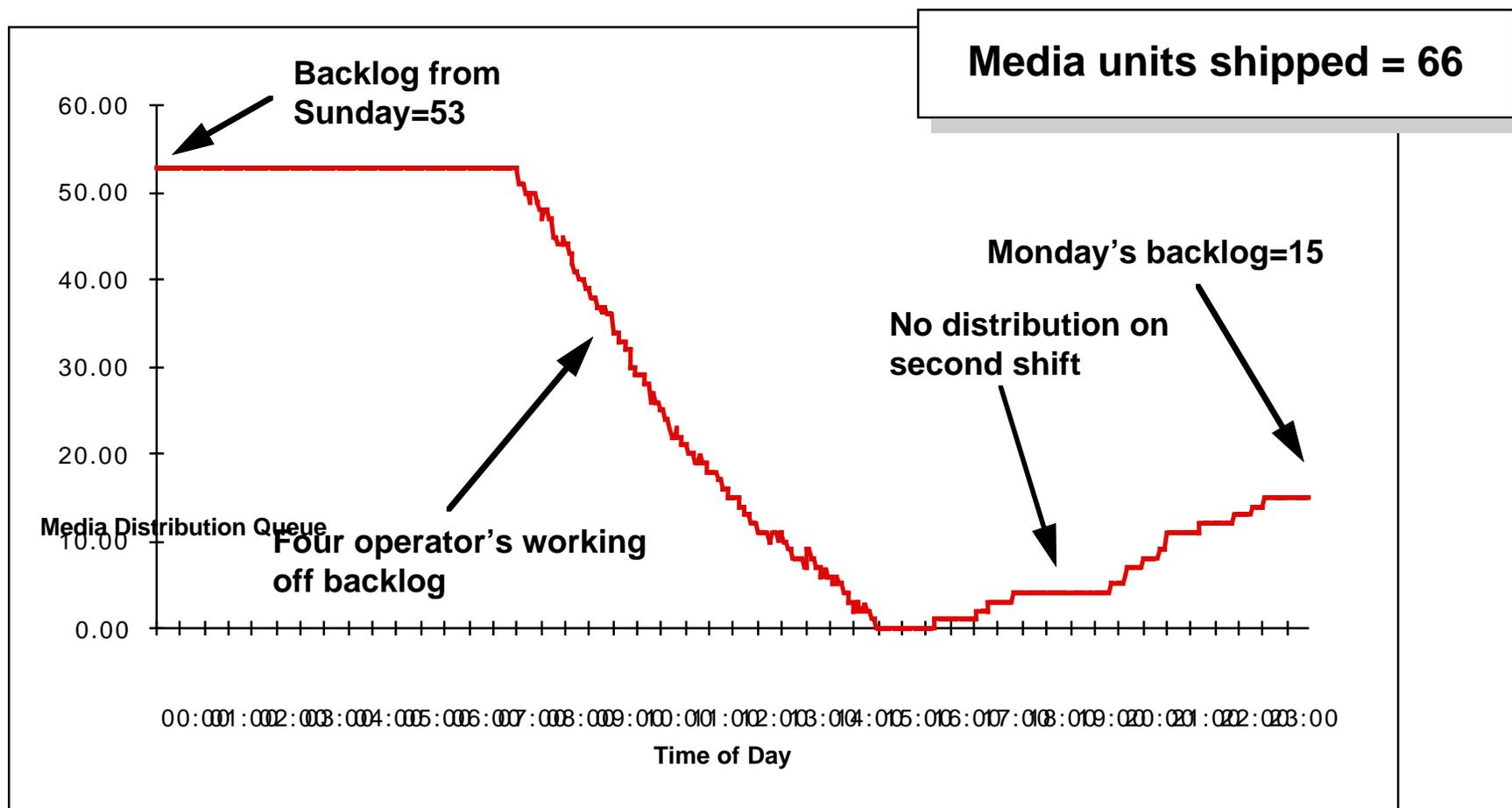
# **Monday, 23-Feb-98, LaRC DAAC**

## **30% Hard Media Data Distribution**

- % of data distributed via hard media: 30%**
- Backlog jobs from Sunday: 53**
- Avg time to build and prepare media: 00:12:00**
- Job time variability: 00:06:00**
- Productivity of each of 3 Data I/D Techs.: 0.75**
- Productivity of Sys. Admin/Comp. Oper.: 0.50**

# Monday, 23-Feb-98, LaRC DAAC

## 30% Hard Media Data Distribution Backlog



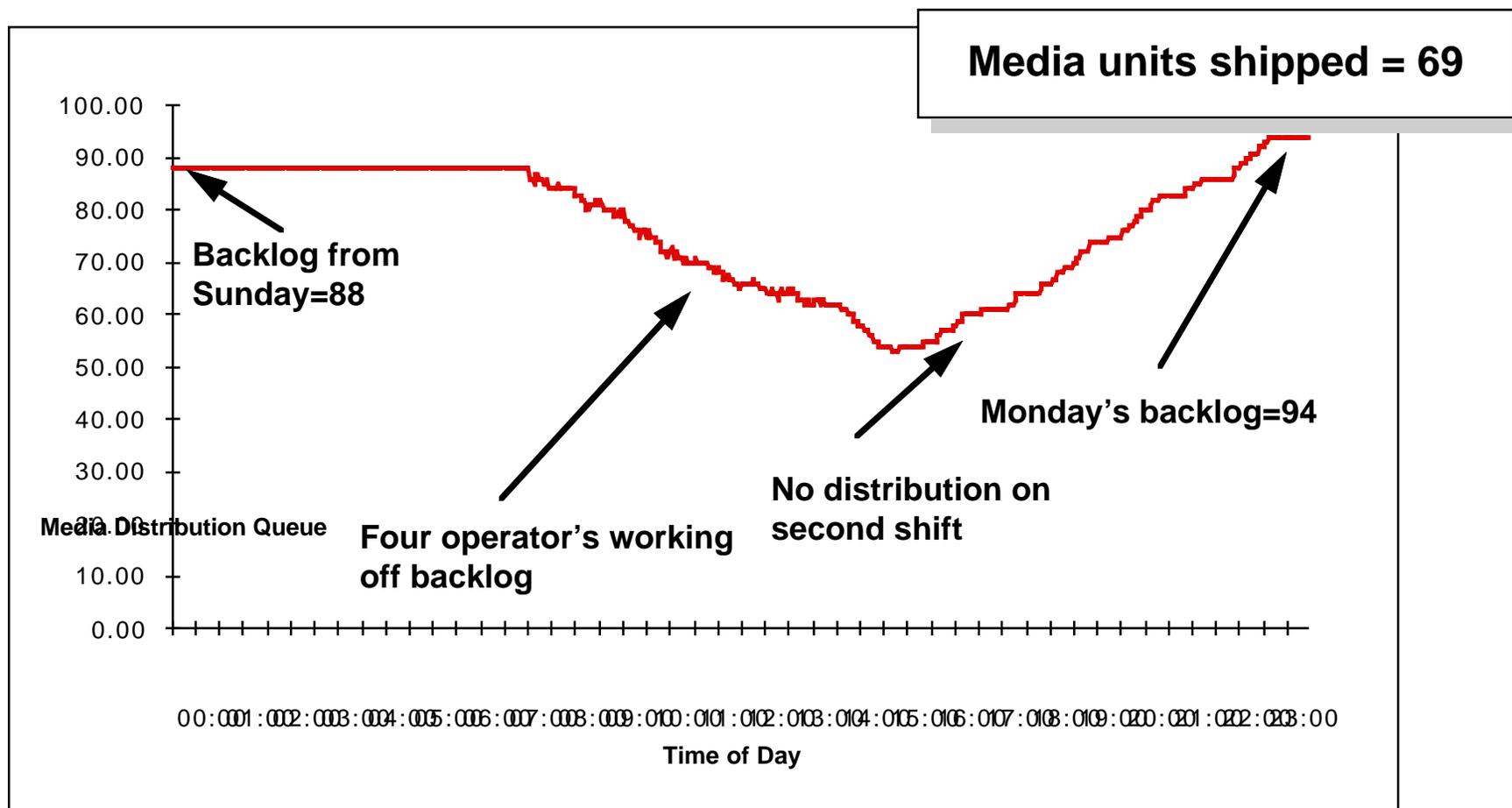
# Monday, 23-Feb-98, LaRC DAAC

## 50% Hard Media Data Distribution

- % of data distributed via hard media: **50%**
- Backlog jobs from Sunday: **88**
- Avg time to build and prepare media: **00:12:00**
- Job time variability: **00:06:00**
- Productivity of each of 3 Data I/D Techs.: **0.75**
- Productivity of Sys. Admin/Comp. Oper.: **0.50**

# Monday, 23-Feb-98, LaRC DAAC

## 50% Hard Media Data Distribution Backlog



# Monday, 23-Feb-98, LaRC DAAC

## 50% Hard Media Data Distribution

- **% of data distributed via hard media:** **50%**
- **Backlog jobs from Sunday:** **88**
- **Avg time to build and prepare media:** **00:06:00**
- **Job time variability:** **00:02:00**
- **Productivity of each of 3 Data I/D Techs.:** **0.75**
- **Productivity of Sys. Admin/Comp. Oper.:** **0.50**

# Monday, 23-Feb-98, LaRC DAAC

## 50% Hard Media Data Distribution Backlog

