# CSAR Service - Management Report

# March 1999

This report documents the quality of the CSAR service during the month of March 1999.

A more comprehensive report is provided quarterly, which will additionally cover wider aspects of the Service such as information on Training, Application Support and Value-Added services.

This and other such reports will be made available through the Web to authorised staff within EPSRC and the other Research Councils, to CfS staff and CSAR Service users. The reports will be indexed in a similar way to which other useful information and news is listed for selection.

## 1. Introduction

This month has seen a variable workload on the system, again with a wide spread of job sizes ranging from 1PE to 512PE jobs, however the bias has been towards jobs of 64 PE's. Again at times during the month the system has been severely under loaded. The reliability of the system has improved this month during core time, however there was one service break out of core time, and an extended maintenance session due to unforeseen complexities during the UNICOS 2.04 upgrade.

This document gives information on Service Quality and on actual usage of the CSAR Service during the reporting period of March 1999. The information, in particular, covers the availability and usage of the following two main CSAR Service High Performance Computing (HPC) systems:

- Cray T3E-1200E/576 (Turing)
- SGi Origin2000/16 (Fermat).

The information is provided in both textual and graphical form, so that it is easier to see trends and variances.

## 2. Service Quality

This section covers overall Customer Performance Assessment Ratings (CPARS), HPC System availability and usage, Service Quality Tokens and other information concerning issues, progress and plans for the CSAR Service.

## 2.1 CPARS

Table 1 gives the measure by which the quality of the CSAR Service is judged. It identifies the metrics and performance targets, with colour coding so that different levels of achievement against targets can be readily identified. Unsatisfactory actual performance will trigger corrective action.

### CSAR Service - Service Quality Report - Performance Targets

| Service Quality Measure | Performance Targets | | | | | |
|---|---|---|---|---|---|---|
| | White | Blue | Green | Yellow | Orange | Red |
| HPC Services Availability | | | | | | |
| Availability in Core Time (% of time) | > 99.9% | > 99.5% | > 99.2% | > 98.5% | > 95% | 95% or less |
| Availability out of Core Time (% of time) | > 99.8% | > 99.5% | > 99.2% | > 98.5% | > 95% | 95% or less |
| Number of Failures in month | 0 | 1 | 2 to 3 | 4 | 5 | > 5 |
| Mean Time between failures in 52 week rolling period (hours) | >750 | >500 | >300 | >200 | >150 | otherwise |
| Help Desk | | | | | | |
| Non In-depth Queries - Maximum Time to resolve 50% of all queries (working days) | < 1/4 | < 1/2 | < 1 | < 2 | < 4 | 4 or more |
| Non In-depth Queries - Maximum Time to resolve 95% of all queries (working days) | < 1/2 | < 1 | < 2 | < 3 | < 5 | 5 or more |
| Administrative Queries - Maximum Time to resolve 95% of all queries (working days) | < 1/2 | < 1 | < 2 | < 3 | < 5 | 5 or more |
| Help Desk Telephone - % of calls answered within 2 minutes | >98% | > 95% | > 90% | > 85% | > 80% | 80% or less |
| Others | | | | | | |
| Normal Media Exchange Requests - average response time in month (working days) | < 1/2 | < 1 | < 2 | < 3 | < 5 | 5 or more |
| New User Registration Time (working days) | < 1/2 | < 1 | < 2 | < 3 | < 4 | otherwise |
| Management Report Delivery Times (working days) | < 1 | < 5 | < 10 | < 12 | < 15 | otherwise |
| System Maintenance - no. of scheduled sessions taken per system in the month | 0 | 1 | 2 | 3 | 4 | otherwise |

**Table 1**

Table 2 gives actual performance information for the period of March 1st to 31st inclusive.
Overall, the CPARS Performance Achievement was satisfactory (see Table 3), i.e. green measured against the CPARS performance targets.

### CSAR Service - Service Quality Report - Actual Performance Achievement

| Service Quality Measure | 1998 | | 1999 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Nov. | Dec. | Jan | Feb | March | April | May | June | July |
| HPC Services Availability | | | | | | | | | |
| Availability in Core Time (% of time) | 99.99% | 97.20% | 99.70% | 100% | 100% | | | | |
| Availability out of Core Time (% of time) | 98.53% | 98.41% | 100% | 99.40% | 98.51% | | | | |
| Number of Failures in month | 2 | 5 | 1 | 3 | 1 | | | | |
| Mean Time between failures in 52 week rolling period (hours) | 400 | 174.1 | 744 | 354 | 432 | | | | |
| Help Desk | | | | | | | | | |
| Non In-depth Queries - Maximum Time to resolve 50% of all queries (working days) | 1 | <0.25 | <0.25 | <0.25 | <0.25 | | | | |
| Non In-depth Queries - Maximum Time to resolve 95% of all queries (working days) | 4 | 5 | <1 | <2 | <1 | | | | |
| Administrative Queries - Maximum Time to resolve 95% of all queries (working days) | 2 | <1 | <1 | <3 | <1 | | | | |
| Help Desk Telephone - % of calls answered within 2 minutes | 100% | 100% | 100% | 100% | 100% | | | | |
| Others | | | | | | | | | |
| Normal Media Exchange Requests - average response time in month (working days) | 0.5 | 0 | <0.5 | 0 | <0.5 | | | | |
| New User Registration Time (working days) | 2 | 0 | <2 | 0 | 0 | | | | |
| Management Report Delivery Times (working days) | 10 | 10 | 10 | 10 | 10 | | | | |
| System Maintenance - no. of scheduled sessions taken per system in the month | 4 | 1 | 2 | 2 | 2 | | | | |

**Table 2**

Notes:

1. HPC Services Availability has been calculated using the following formulae, based on the relative NPB performance of Turing and Fermat:

$$[\text{ Turing availability } \times 122 / (122 + 3.5) ] + [\text{ Fermat availability } \times 3.5 / (122 + 3.5) ]$$

2 Mean Time between failures for Service Credits is formally calculated from Go-Live Date.

Table 3 gives Service Credit values for the month of March. These will be accounted on a quarterly basis, formally from the Go-Live Date. The values are calculated according to agreed Service Credit Ratings and Weightings.

## CSAR Service - Service Quality Report - Service Credits

| Service Quality Measure | 1998 | | 1999 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Nov. | Dec. | Jan | Feb | March | April | May | June | July |
| HPC Services Availability | | | | | | | | | |
| Availability in Core Time (% of time) | -0.058 | 0.078 | -0.039 | -0.058 | -0.058 | | | | |
| Availability out of Core Time (% of time) | 0.000 | 0.039 | -0.047 | 0.000 | 0.000 | | | | |
| Number of Failures in month | 0.000 | 0.016 | -0.008 | 0.000 | -0.008 | | | | |
| Mean Time between failures in 52 week rolling period (hours) | 0.000 | 0.016 | -0.009 | 0.000 | 0.000 | | | | |
| Help Desk | | | | | | | | | |
| Non In-depth Queries - Maximum Time to resolve 50% of all queries (working days) | 0.000 | -0.019 | -0.019 | -0.019 | -0.019 | | | | |
| Non In-depth Queries - Maximum Time to resolve 95% of all queries (working days) | 0.031 | 0.046 | -0.016 | -0.016 | -0.016 | | | | |
| Administrative Queries - Maximum Time to resolve 95% of all queries (working days) | 0.000 | -0.016 | -0.016 | 0.016 | -0.016 | | | | |
| Help Desk Telephone - % of calls answered within 2 minutes | -0.004 | -0.004 | -0.004 | -0.004 | -0.004 | | | | |
| Others | | | | | | | | | |
| Normal Media Exchange Requests - average response time in month (working days) | -0.002 | 0.000 | -0.002 | 0.000 | -0.002 | | | | |
| New User Registration Time (working days) | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | | | | |
| Management Report Delivery Times (working days) | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | | | | |
| System Maintenance - no. of scheduled sessions taken per system in the month | 0.006 | -0.003 | 0.000 | 0.000 | 0.000 | | | | |
| Monthly Total & overall Service Quality Rating for each period: | -0.01 | 0.08 | -0.08 | -0.04 | -0.06 | 0.00 | 0.00 | 0.00 | 0.00 |
| Quarterly Service Credits: | | | | | -0.18 | | | | |

**Table 3**

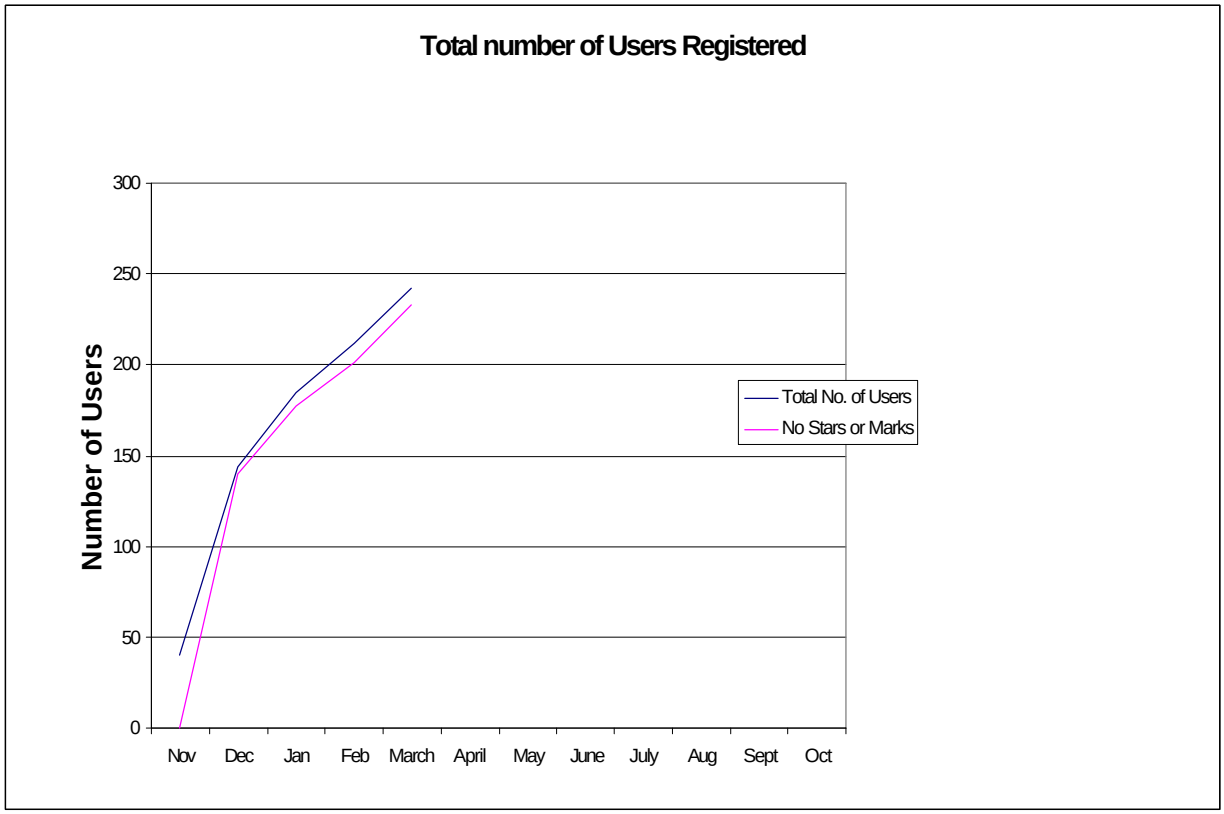
## 2.2 Service Quality Tokens

The current position at the end of March 1999 is that 9 of the 212 registered users of the CSAR Service had used Service Quality Tokens. See below:

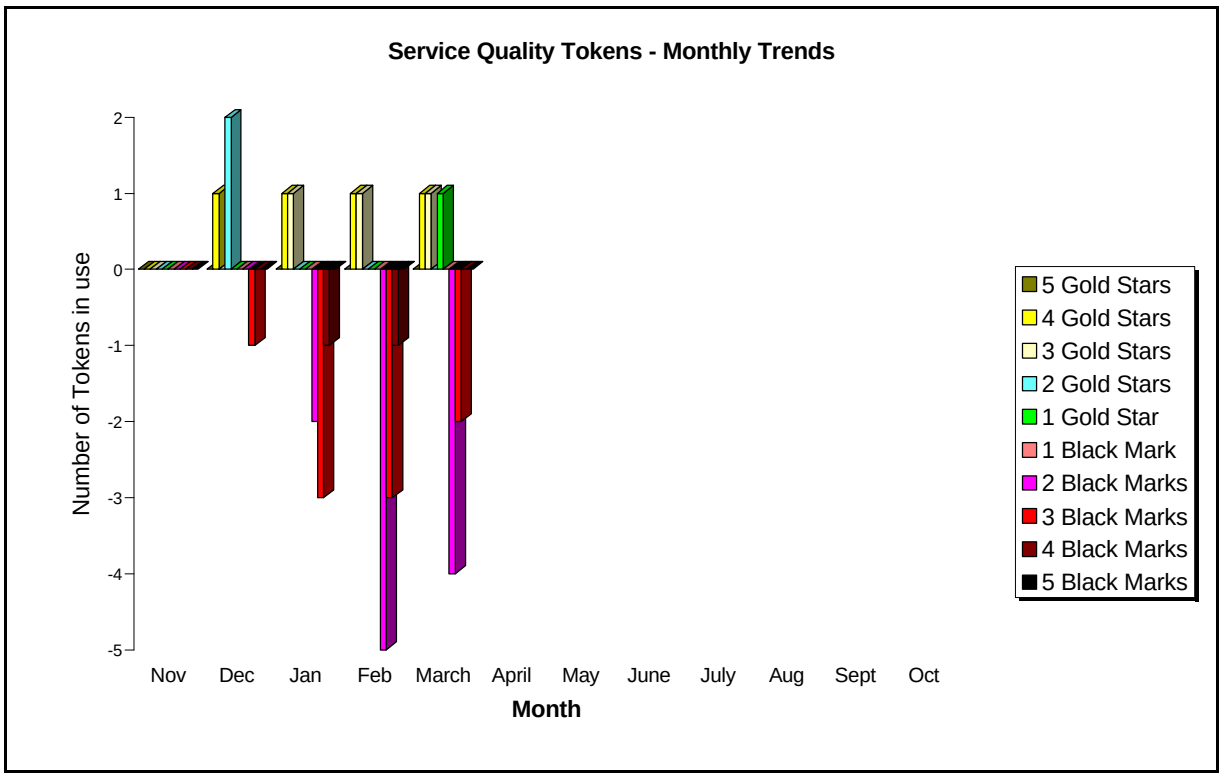
# Service Quality Tokens

| | Position as at end of each month | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Nov | Dec | Jan | Feb | March | April | May | June | July | Aug | Sept | Oct |
| 5 Gold Stars | 0 | 0 | 0 | 0 | 0 | | | | | | | |
| 4 Gold Stars | 0 | 1 | 1 | 1 | 1 | | | | | | | |
| 3 Gold Stars | 0 | 0 | 1 | 1 | 1 | | | | | | | |
| 2 Gold Stars | 0 | 2 | 0 | 0 | 0 | | | | | | | |
| 1 Gold Star | 0 | 0 | 0 | 0 | 1 | | | | | | | |
| No Stars or Marks | 0 | 140 | 177 | 201 | 233 | | | | | | | |
| 1 Black Mark | 0 | 0 | 0 | 0 | 0 | | | | | | | |
| 2 Black Marks | 0 | 0 | 2 | 5 | 4 | | | | | | | |
| 3 Black Marks | 0 | 1 | 3 | 3 | 2 | | | | | | | |
| 4 Black Marks | 0 | 0 | 1 | 1 | 0 | | | | | | | |
| 5 Black Marks | 0 | 0 | 0 | 0 | 0 | | | | | | | |
| Total No. of Users | 40 | 144 | 185 | 212 | 242 | | | | | | | |

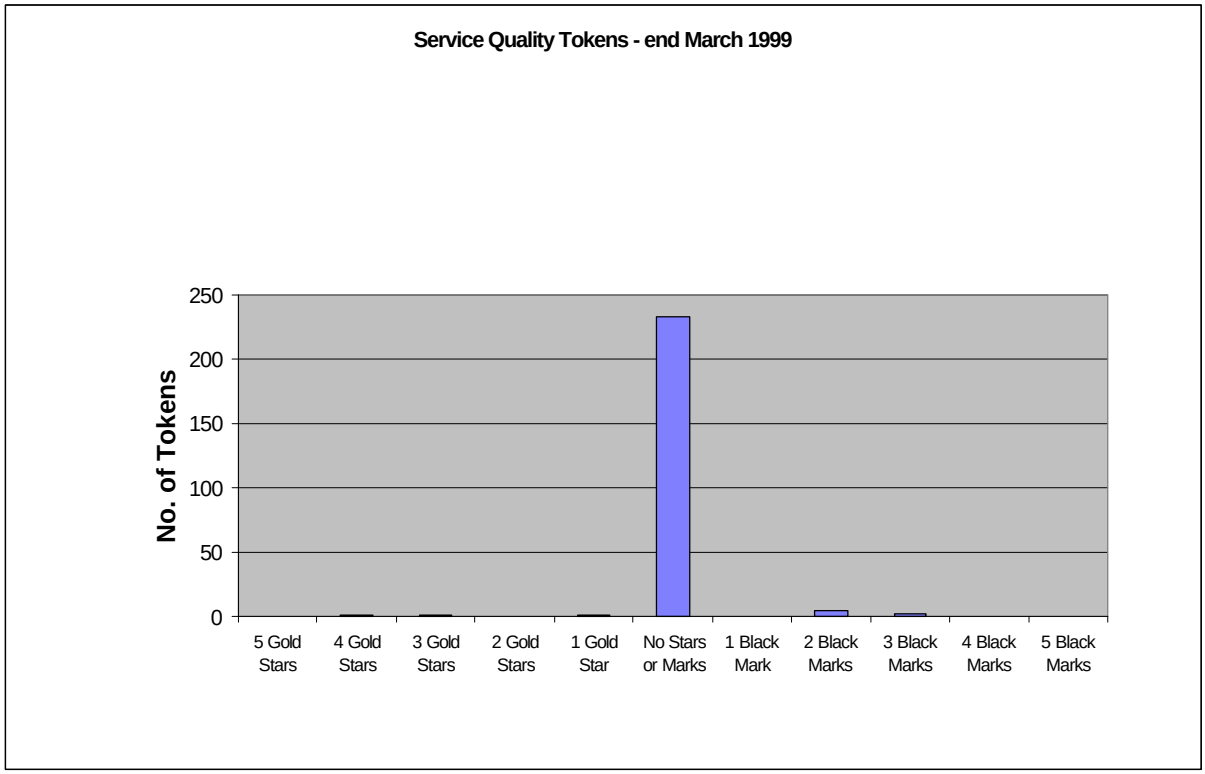
The graph below shows the total number of registered users on the CSAR Service and the number of users holding a neutral view of the service.



The graph below illustrates the monthly usage trend of quality tokens:



In the form of a bar chart, the current statistics are:




**SUMMARY OF SERVICE QUALITY TOKEN USAGE**

| No of Stars or Marks | PI/User | Consortia | Date Allocated | Reason Given |
|---|---|---|---|---|
| 3 Black Marks | Prof. Mike Gillan | CSE002 | 08/12/98 | Early problems experienced by the Consortium. |
| 3 Black Marks | Neil Sandham | CSE004 | 12/02/99 | Registration System deficiencies and complexities. |
| 2 Black Marks | Dr. Nick Harrison | CSE002 | 21/01/99 | Registration System speed, lack of a sub project facility. On the positive side Improvements in scheduling to allow larger jobs to run. |
| 2 Black marks | Dr. Andrew Sunderland | CSE003 | 26/02/99 | Interactive pool problems, now resolved. |
| 2 Black Marks | David Bird | CSE002 | 04/02/99 | Lack of group level CPU management for UKCP. |
| 2 Black Marks | Paul Bristowe | CSE002 | 05/02/99 | Lack of group level CPU management for UKCP. |
| 1 Gold Star | Phil Linden | CSE002 | 31/03/99 | Improvements in Registration system page speed. |
| 3 Gold Stars | Paul Kent | CSE007 | 27/01/99 | Reliability good, particularly no job loss or problems following maintenance sessions. |
| 4 Gold Stars | Dr. Patrick Briddon | CSE006 | 07/12/99 | Good job throuput and rapid response to queries |

The above table summarises the currently allocated Service Quality Tokens, detailing the reason given for the allocation of the tokens.

## 2.3 Throughput Target against Baseline

The Baseline capacity was not fully utilised this month due to insufficient workload. Actual percentage utilisation compared with Baseline during the 31-day period was 89.68%.

**Job Throughput Against Baseline CSAR Service Provision**

**Period: 1st to 31st March 1999**

| | | | |
|---|---|---|---|
| | **Baseline Capacity for Period (T3E PE Hours)** | **Actual Usage in Period (T3E PE Hours)** | **Actual % Utilisation c/w Baseline during Period** |
| 1. Has CfS failed to deliver Baseline MPP Computing Capacity for EPSRC? | 361,804 | 324,464 | **89.68%** |
| | **Baseline Capacity for Period (T3E PE Hours)** | **Job Time Demands in Period** | **Job Demand above 110% of Baseline during Period (Yes/No)?** |
| 2. Have Users submitted work demanding > 110% of the Baseline during period? | 361,804 | 324,656 | No |
| | | **Number of Jobs at least 4 days old at end Period** | **Number of Jobs at least 4 days old at end Period is not zero (Yes/No)?** |
| 3. Are there User Jobs oustanding at the end of the period over 4 days old? | | 0 | No |
| | | **Minimum Job Time Demands as % of Baseline during Period** | **Minimum Job Time Demand above 90% of Baseline during Period (Yes/No)?** |
| 4. Have Users submitted work demands above 90% of the Baseline during period? | | 0% | No |
| | **Number of standard Job Queues (ignoring priorities)** | **Average % of time each queue contained jobs in the Period** | **Average % of time each queue contained jobs in the Period is > 97%?** |
| 5. Majority of Job Queues contained jobs from Users for more than 97% during period? | 4 | 73.7% | No |

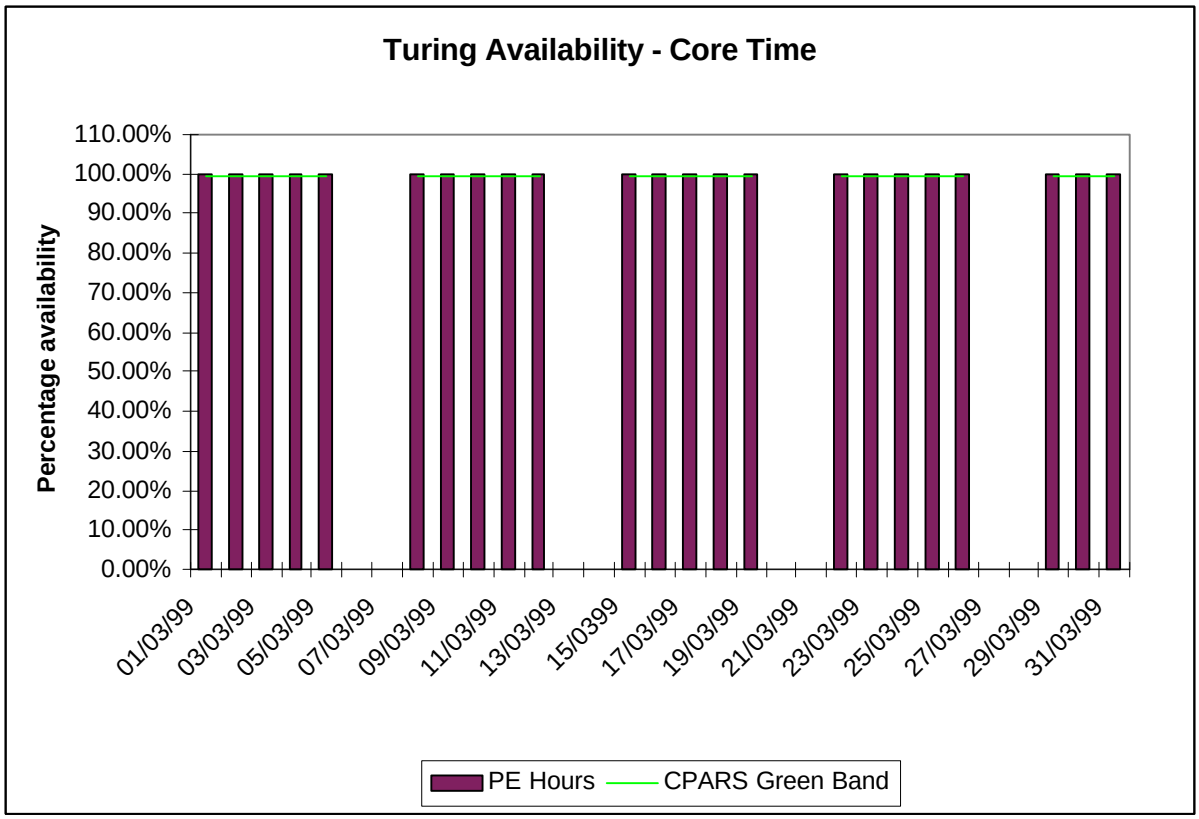
# 3. System Availability

Service availability each reporting period is calculated as a percentage of actual availability time over theoretical maximum time, after accounting for planned breaks in service for preventative maintenance.

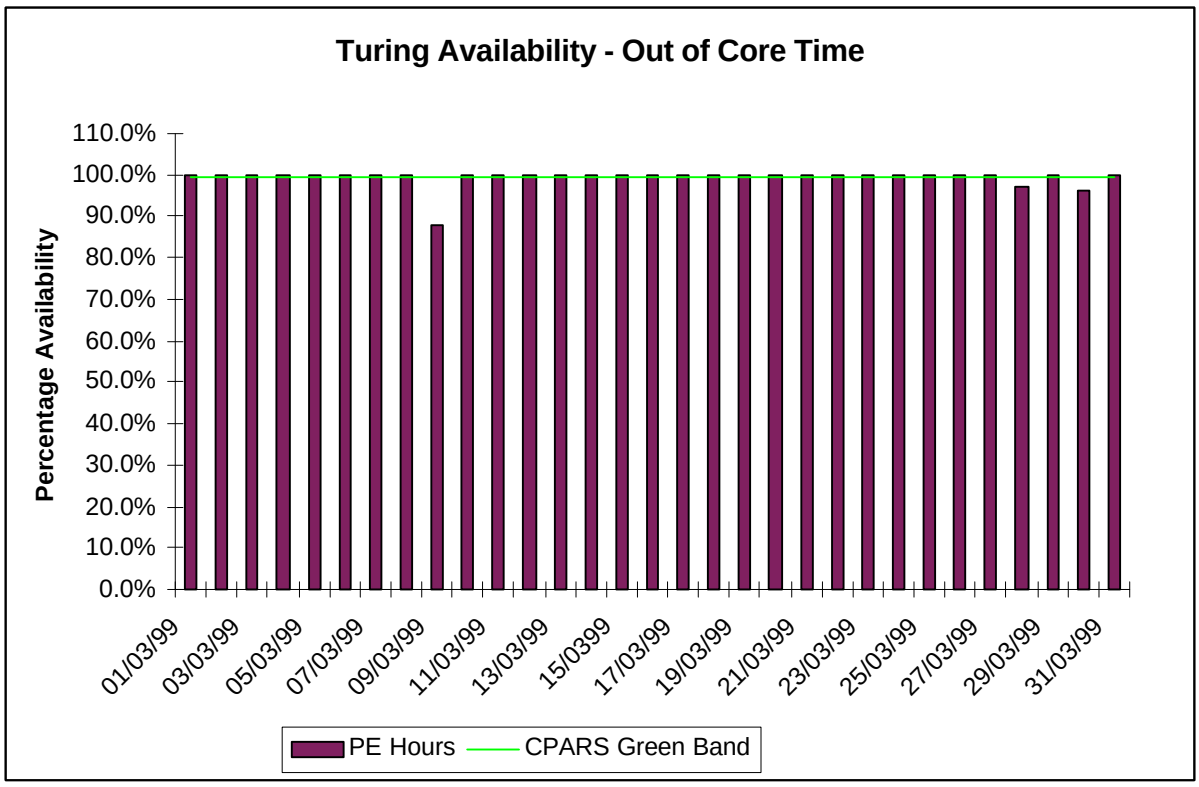
## 3.1 Cray T3E-1200E System (Turing)

The following graphs show the availability of Turing both in core time and out of core time respectively during the period of 1st to 31st March.

Turing availability for March:



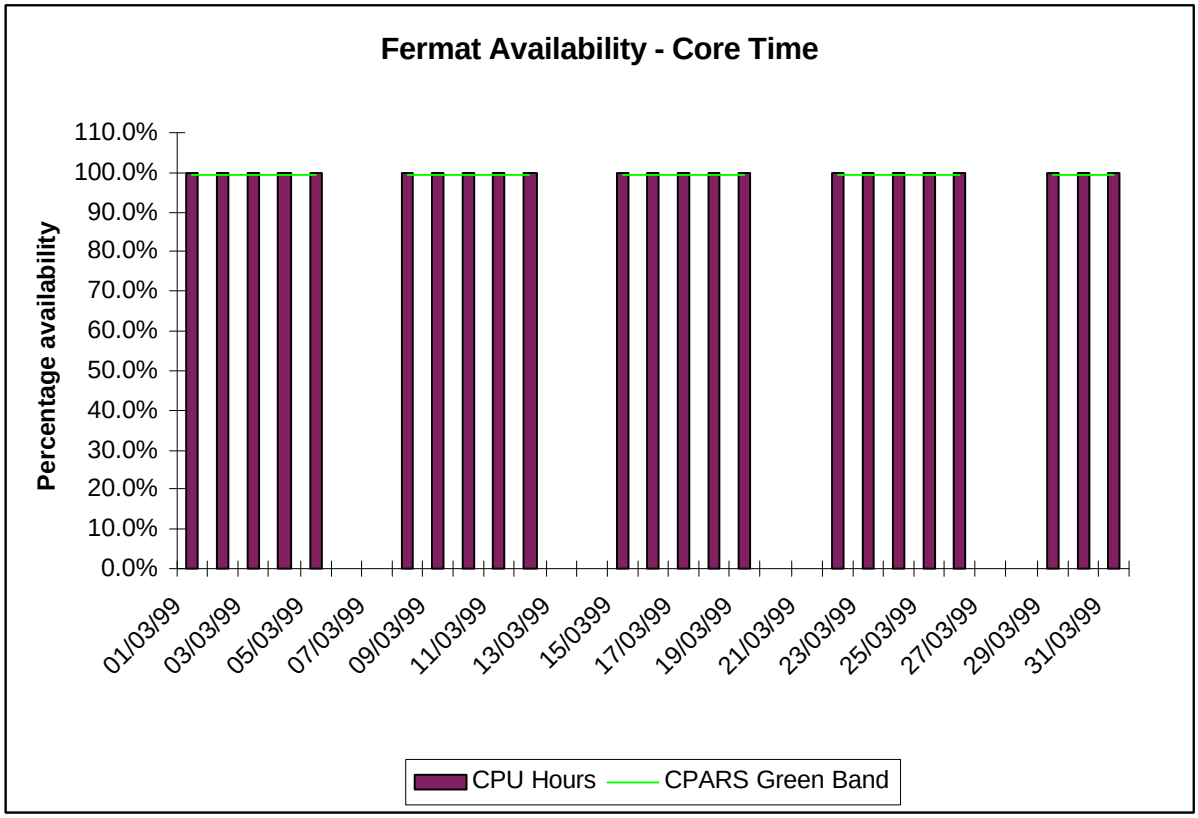

Availability of Turing in core time during March was excellent.



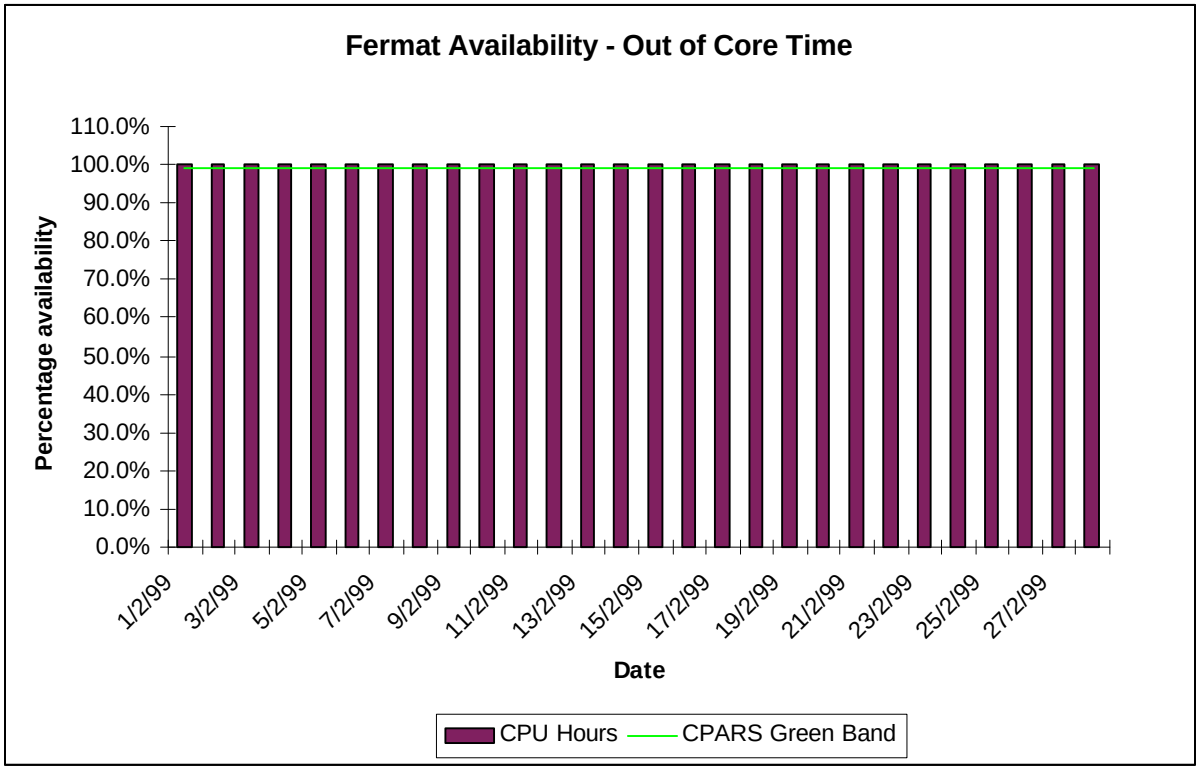

Availability of Turing out of core time during was good apart one PSU failure and the additional time lost during the operating system upgrade as mentioned elsewhere.

## 3.2 SGI Origin2000 System (Fermat)

The following graphs show the availability of Fermat both in core time and out of core time respectively.




Availability of Fermat in core time during March was excellent.




Availability of Fermat out of core time during March was excellent.

## 4. HPC Services Usage

Usage information is given in tabular form, in Appendices, and in graphical format. The system usage information for the period of March 1st to 31st is provided by Project/User Group, totalled by Research Council and overall. This covers:

| | | |
|---|---|---|
| • CPU usage | Turing: 324,651 PE Hours | Fermet: 4,289 CPU Hours |
| • User Disk allocation | Turing: 49.31 GB Years | Fermat: 20.61 GB Years |
| • HSM/tape usage | 206.99 GB Years | |

In addition, the following graphs are provided to illustrate usage per month, historically:

a) MPP (T3E) Usage by month, showing usage each month of CPU (T3E PE Elapsed Hours), split by Research Council and giving the equivalent GFLOP-Years as per NPB. The Baseline Capacity (103 GFLOP-Years) is shown by an overlaid horizontal line.

b) SMP (Origin) Usage by month, showing usage each month in CPU Hours, split by Research Council and giving the equivalent GFLOP-Years as per NPB. The Baseline Capacity (3.5 GFLOP-Years) is shown by an overlaid horizontal line.

c) High Performance Disk (T3E) allocated for User Data by month, showing the allocated space each month in GBytes, split by Research Council. The Baseline Capacity (1 Terabyte) is shown by an overlaid horizontal line.

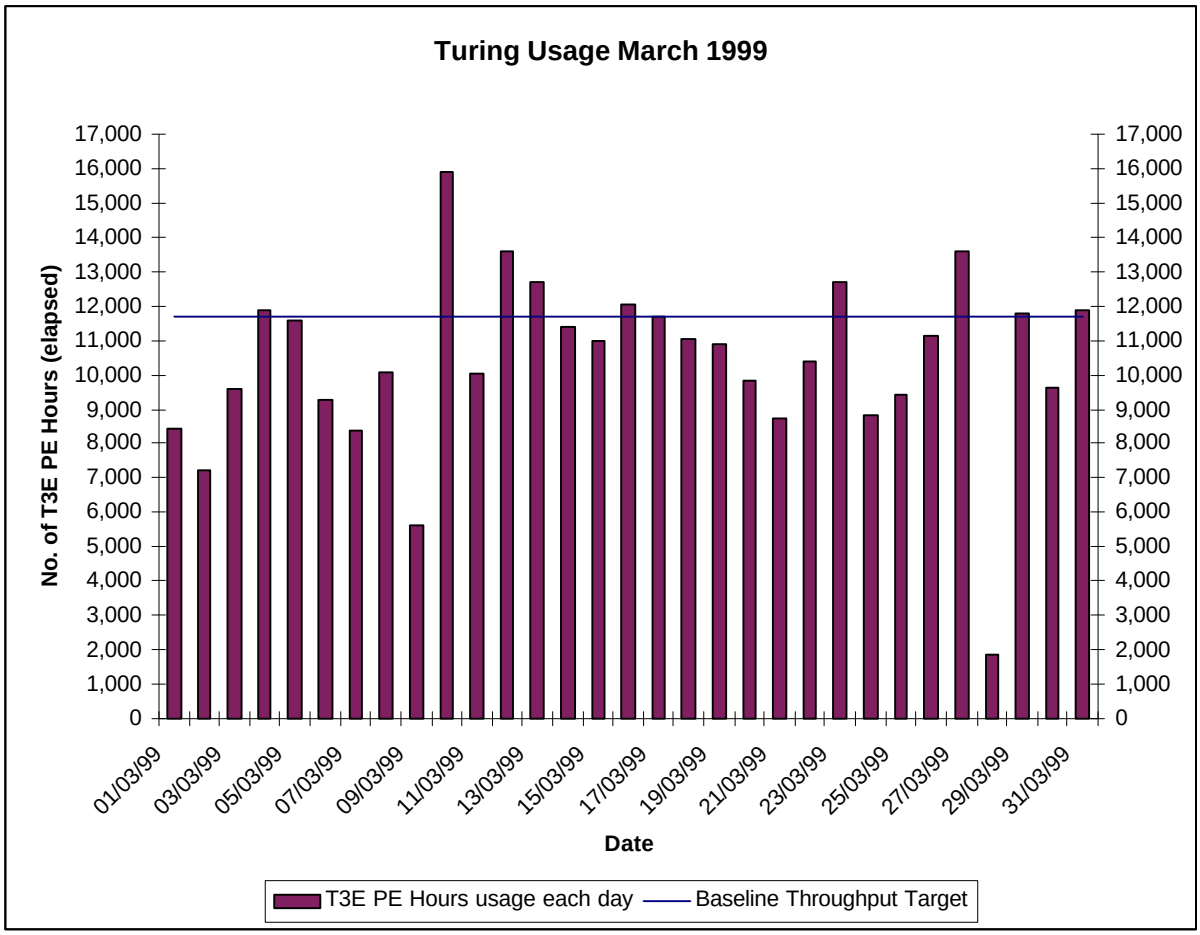
d) Medium Performance Disk (Origin) allocated for User Data by month, showing the allocated space each month in GBytes, split by Research Council. The Baseline Capacity (1.5 Terabytes) is shown by an overlaid horizontal line.

e) HSM/Tape Usage (T3E) by month, showing the volumes held each in GBytes, split by Research Council. The Baseline Capacity (16 Terabytes) available will be shown by an overlaid horizontal line.

## 4.1 Cray T3E-1200E System (Turing)

The following graph shows the usage of Turing during each day of March 1999. Note that there is some variance on a day-to-day basis as the accounts record job times, and thus CPU usage figures, at the time of job completion which could be the second actual day for large jobs. At present, there is a 12 hour limit on jobs, so that they are check-pointed, and computational time lost due to any failure is well managed.

Turing usage for March:

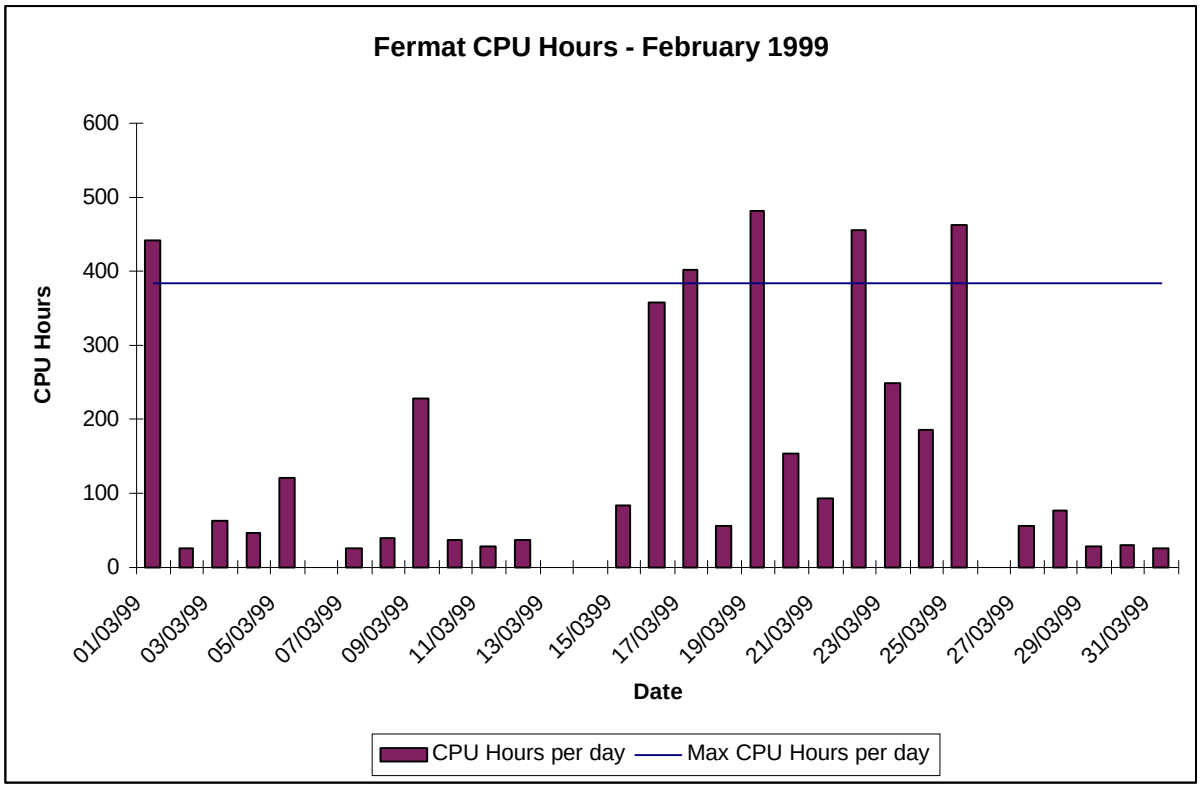



The above usage graph for the Turing system shows that the overall workload tailed off towards the end of each week. This resulted in the system running, on average, under baseline.

Fine tuning of the CfS scheduling system will continue to ensure minimal wasting of PE resource, in order to fit in a number of different sized jobs (e.g. 32, 64, 128, 256) thus facilitating maximised job throughput.

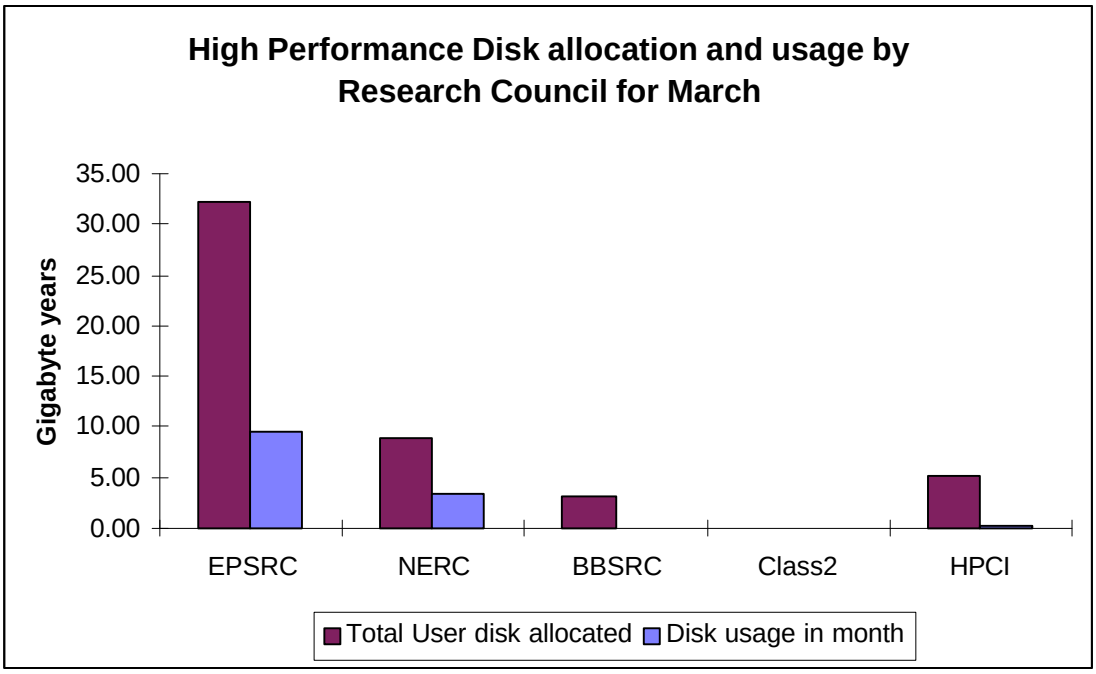
## 4.2 SGi Origin2000 System (Fermat)

The usage of the Origin system was good for the month with the daily usage of the system averaging 36% of theoretical maximum. This figure does not show that in some periods CPU time is running at 99.9% of the total available CPU time. The groups most heavily using the Fermat system are CSE009 and CSN001.

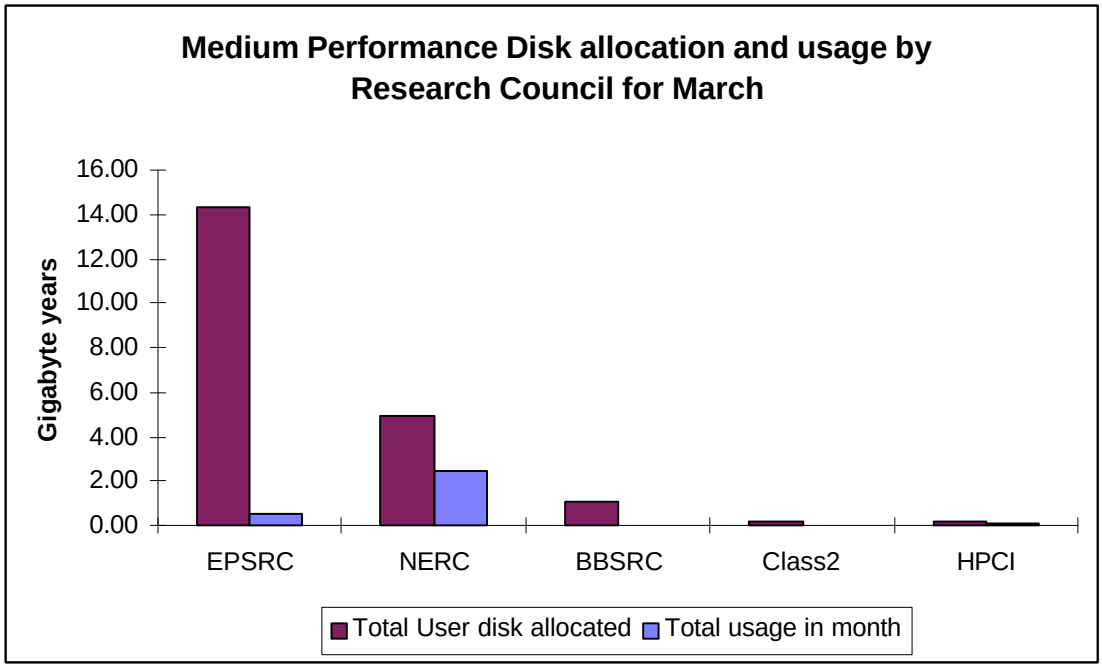



## 4.3 Disk/HSM Usage Charts

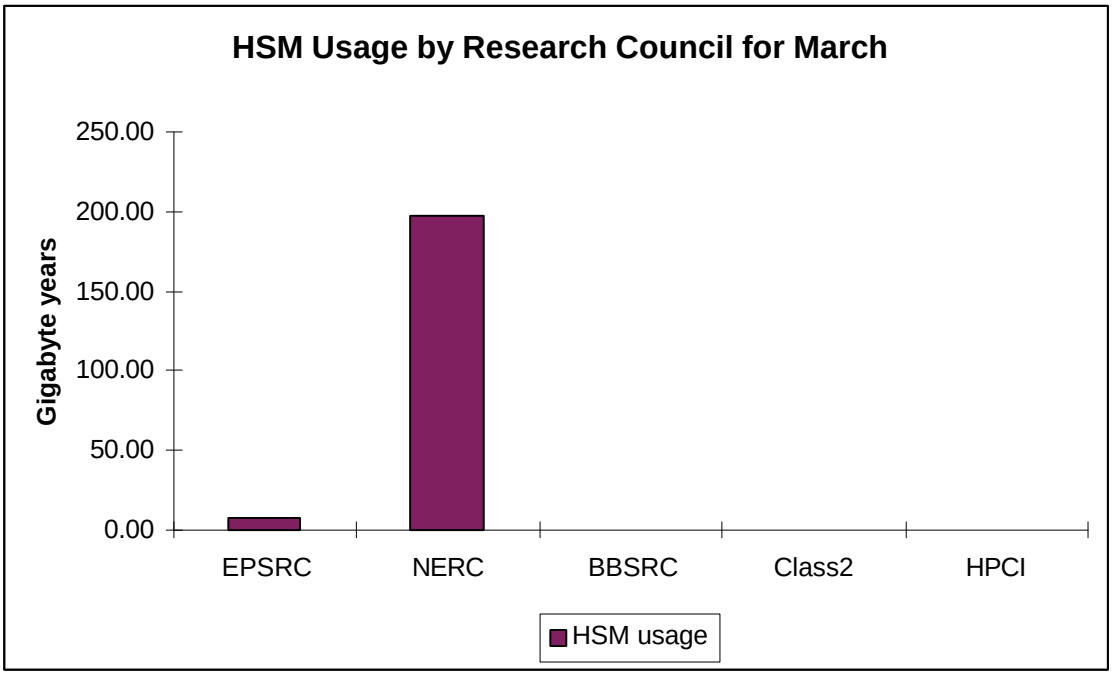
The graphs below show current disk and HSM allocations and usage.




The preceding graph shows actual usage against the current allocation of disk on the Turing system.

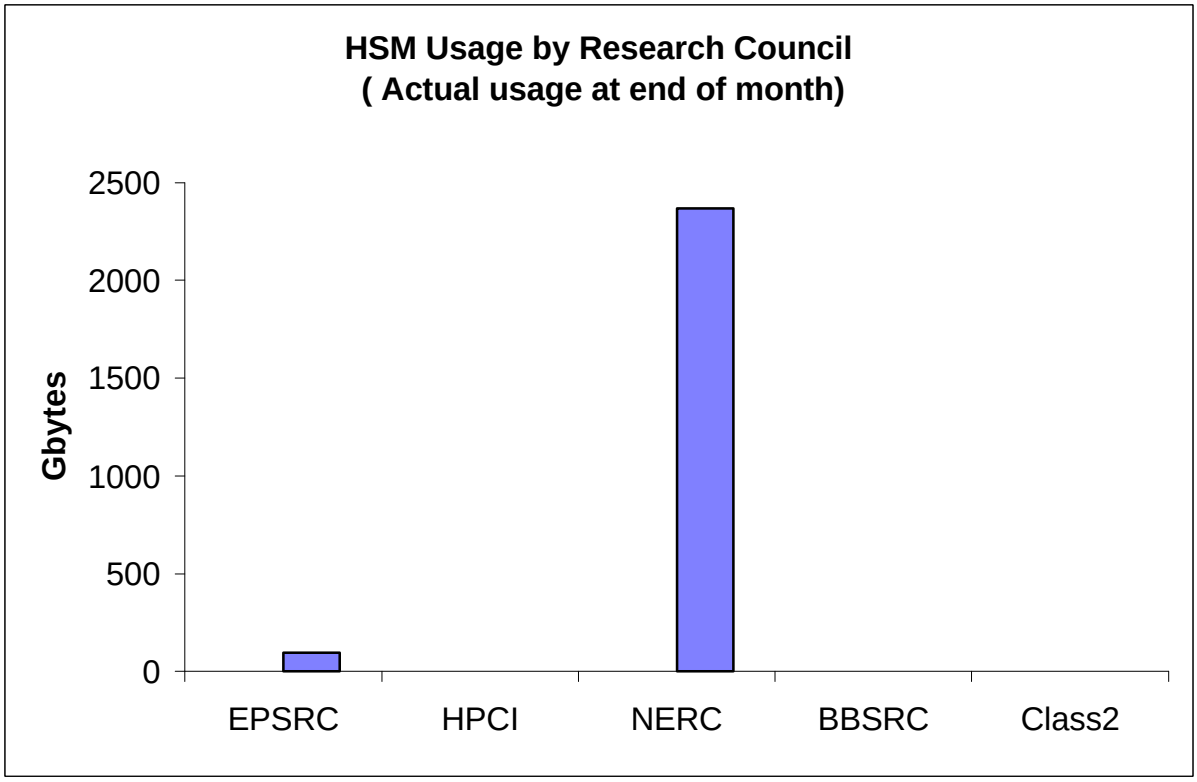


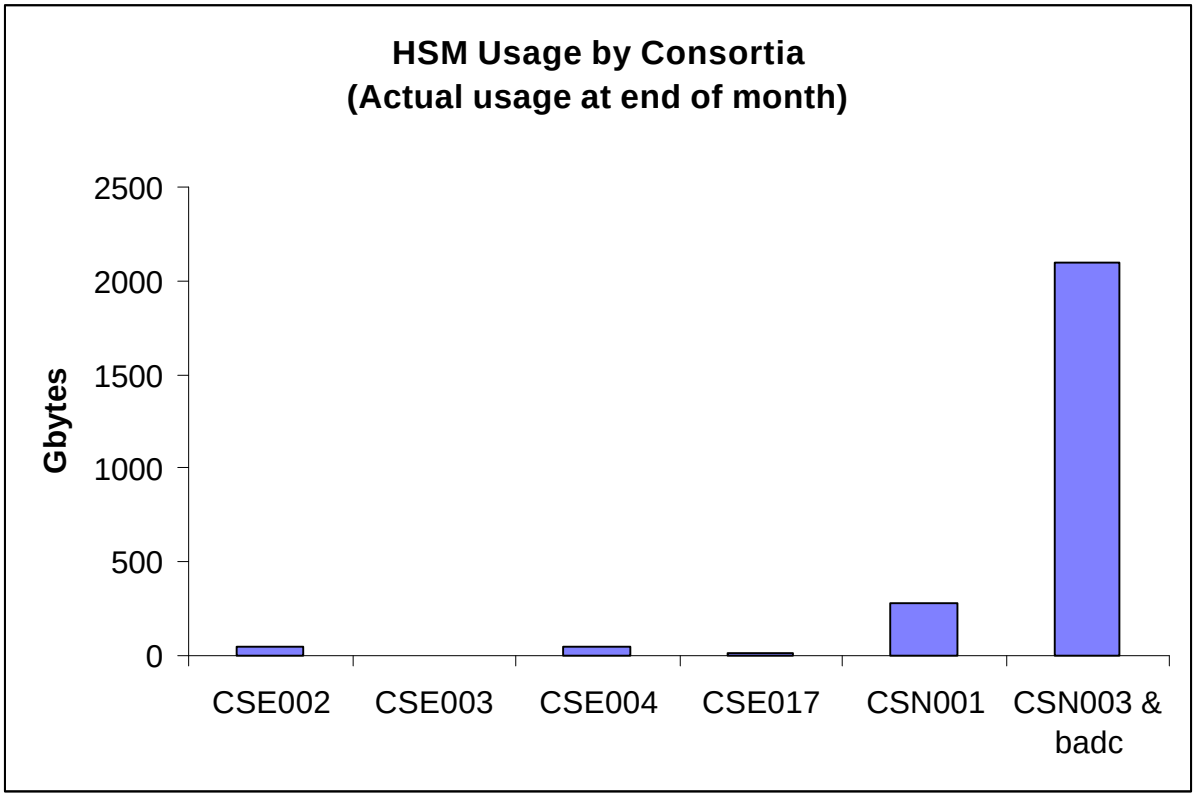

The above graph shows the disk allocations against usage of the disk on Fermat.



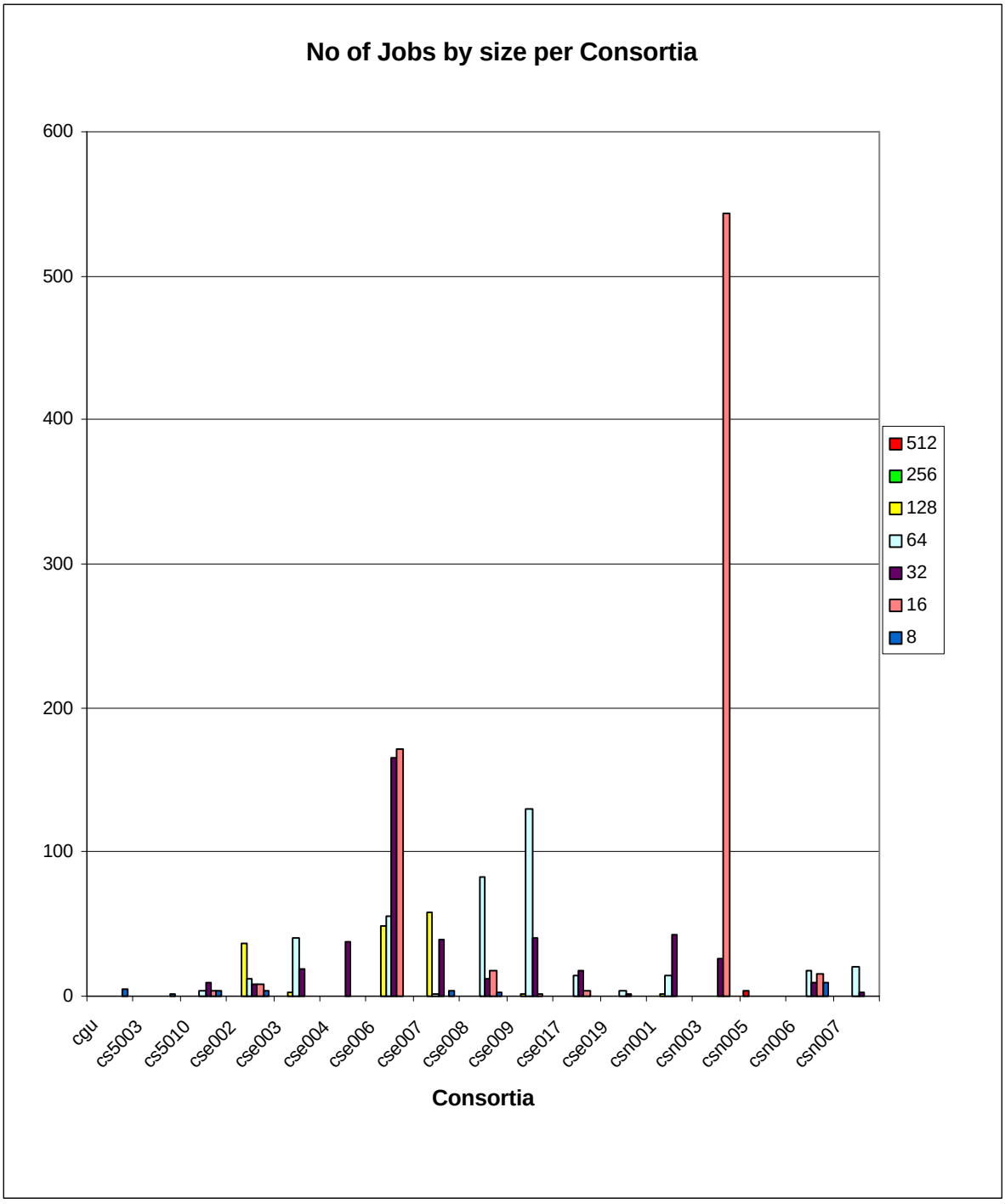

The above graph shows the total usage of the HSM facility by Research Council.

The next two graphs give actual usage of HSM by Research Council and by Consortium.

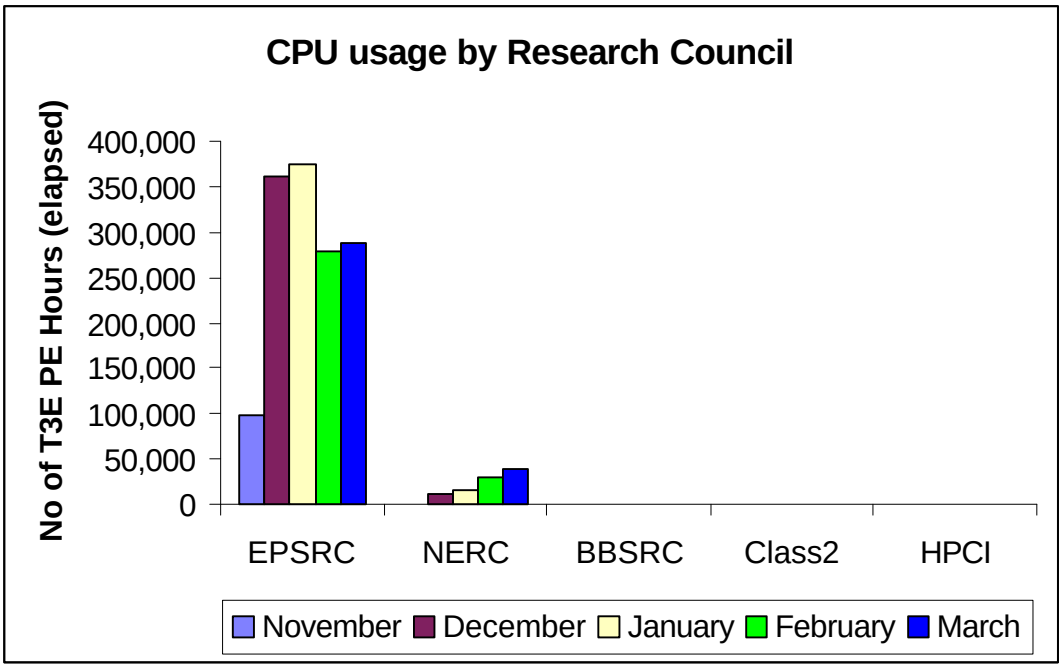


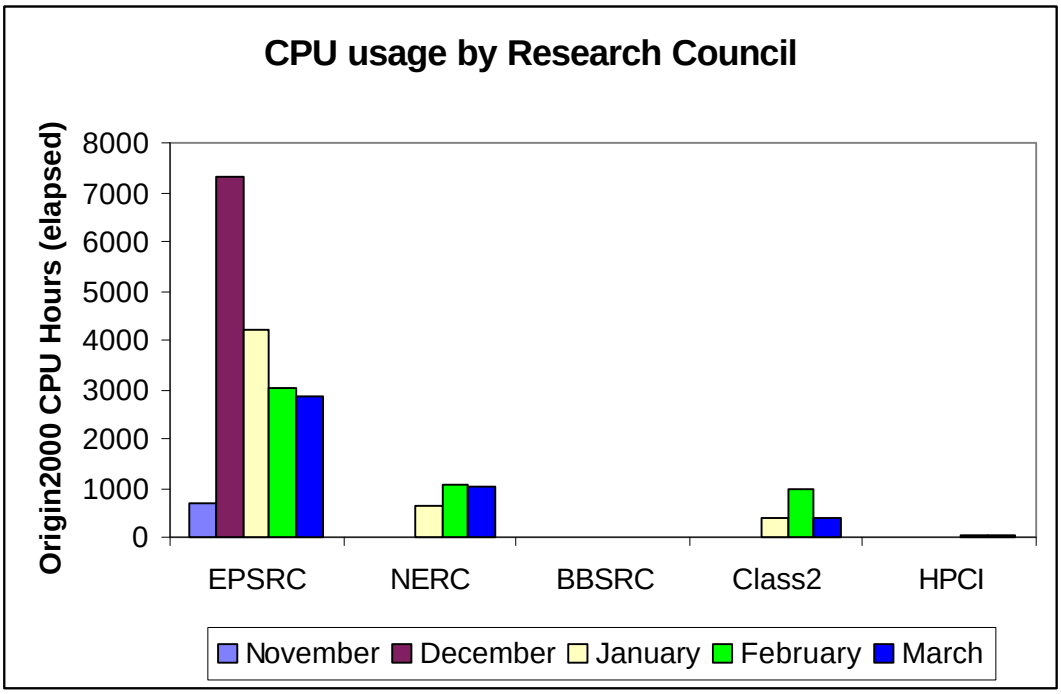
Job statistics for Turing:




The above graph shows the number of jobs of the major sizes run in the period 1st to 31st March 1999.




Turing PE usage is shown by Research Council during the months of service to date in the above chart.

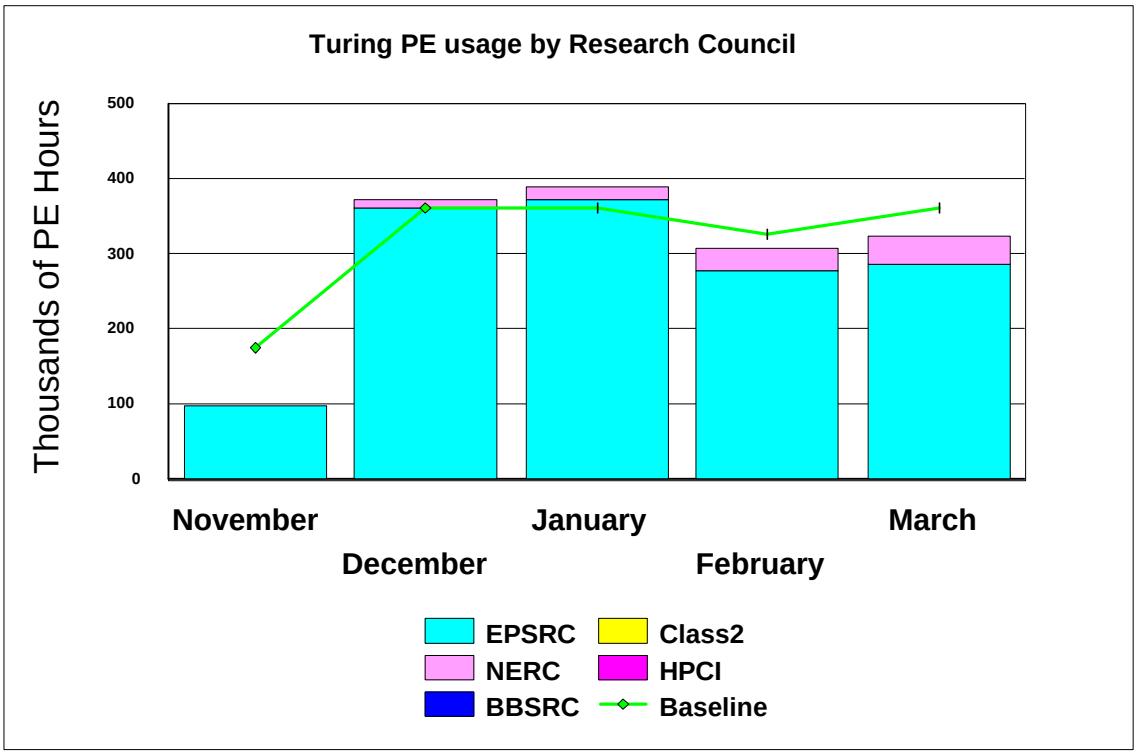



Origin 2000 CPU usage is shown by Research Council during the months of service to date in the above chart.

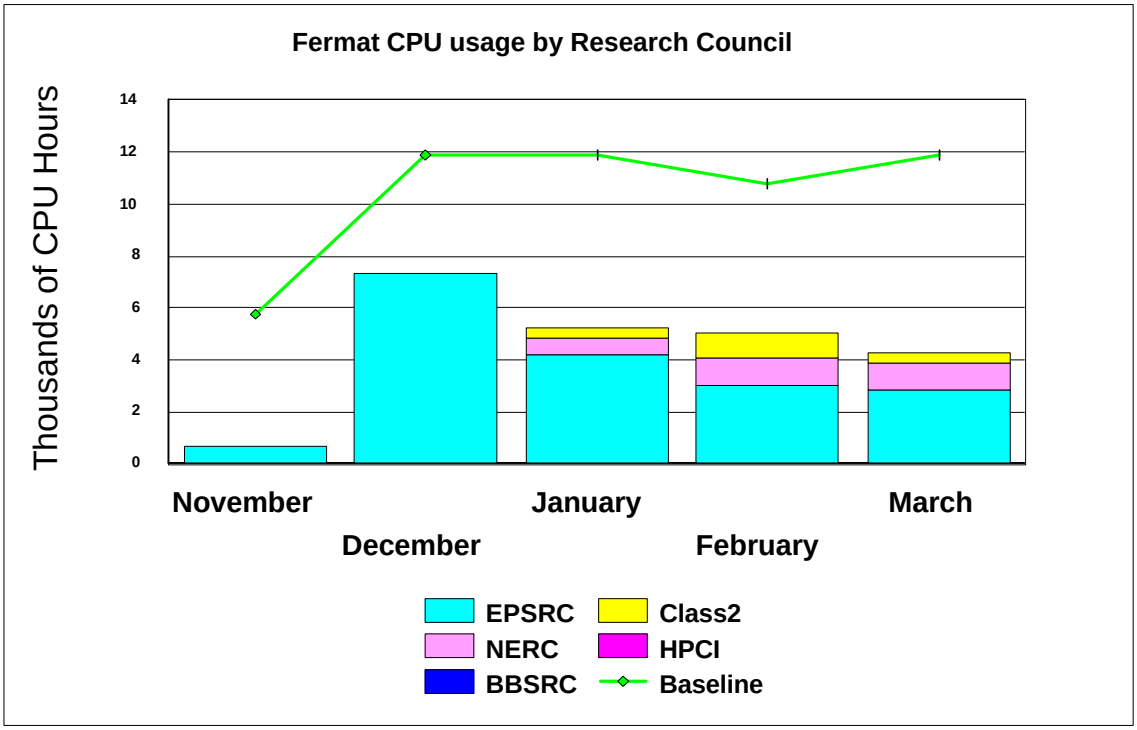
## 4.4 Historical Usage Charts

.In all the Usage Charts, the baseline varies dependant on the number of days in each month, within a 365 day year. The reduced Baseline in November 1998 represents half a month.

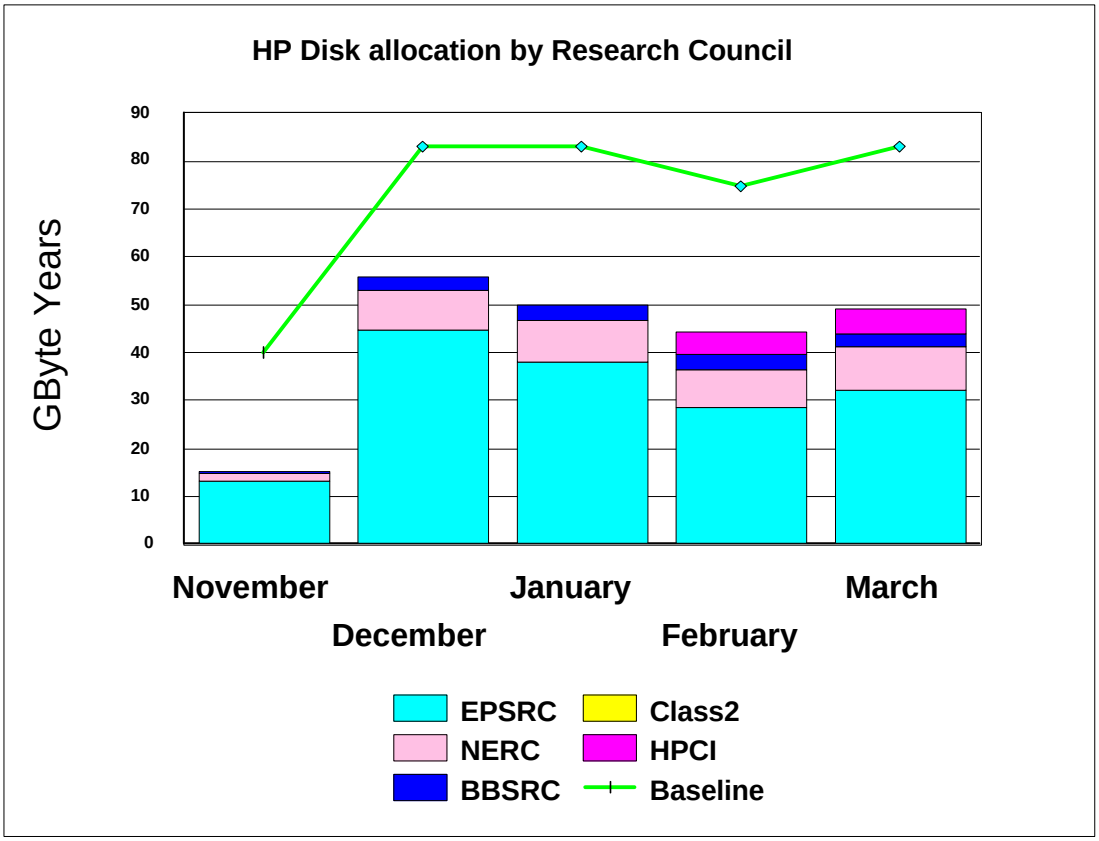
The graph below shows the PE hour's utilisation on Turing by Research Council from November 1998.



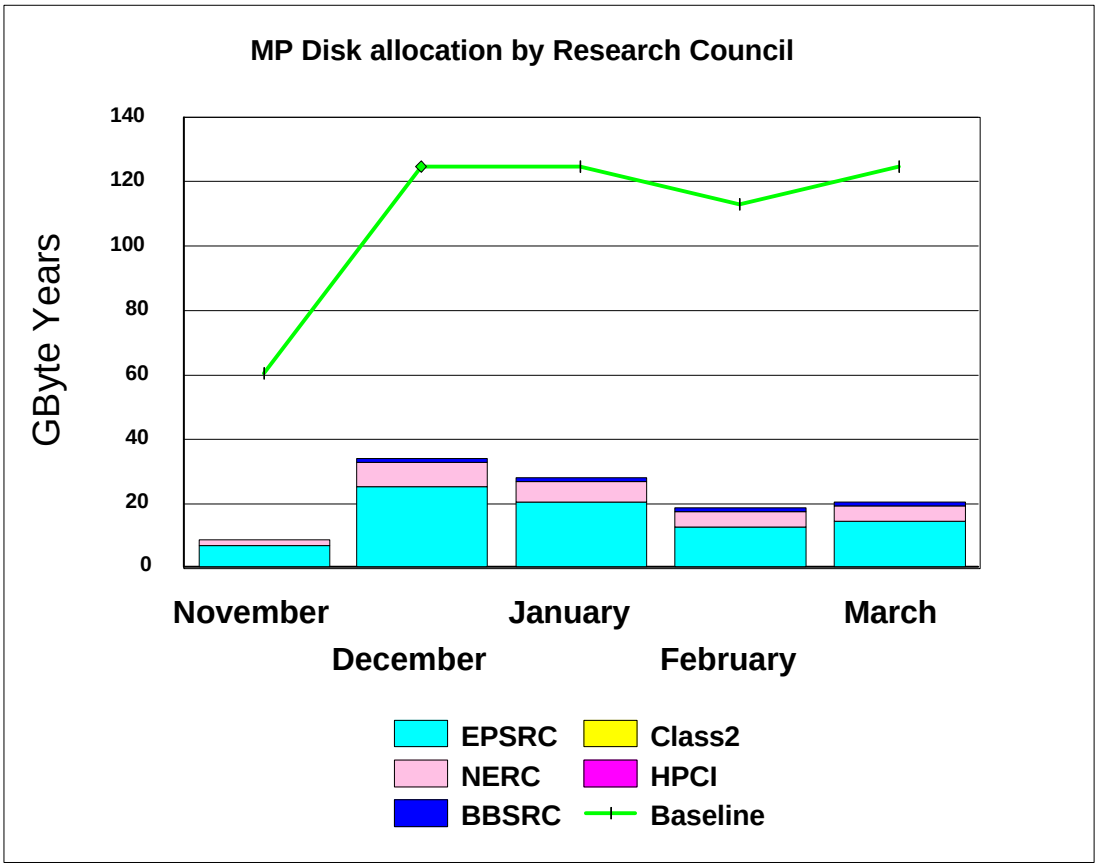

The graph below shows the historic CPU usage on Fermat by Research Council from November.



The next series of graphs illustrates the usage of the disk and HSM resources of the system.

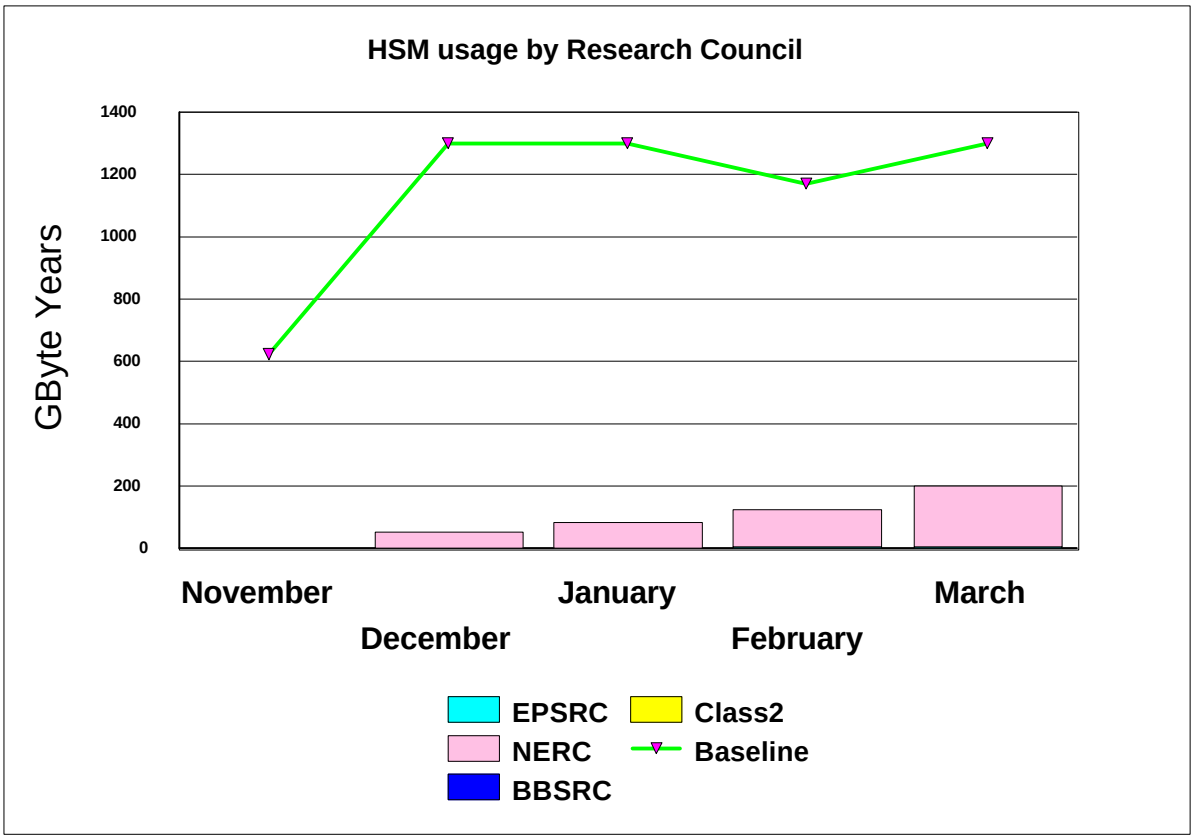



The preceding graph illustrates the historic allocation of the High Performance Disk on Turing.



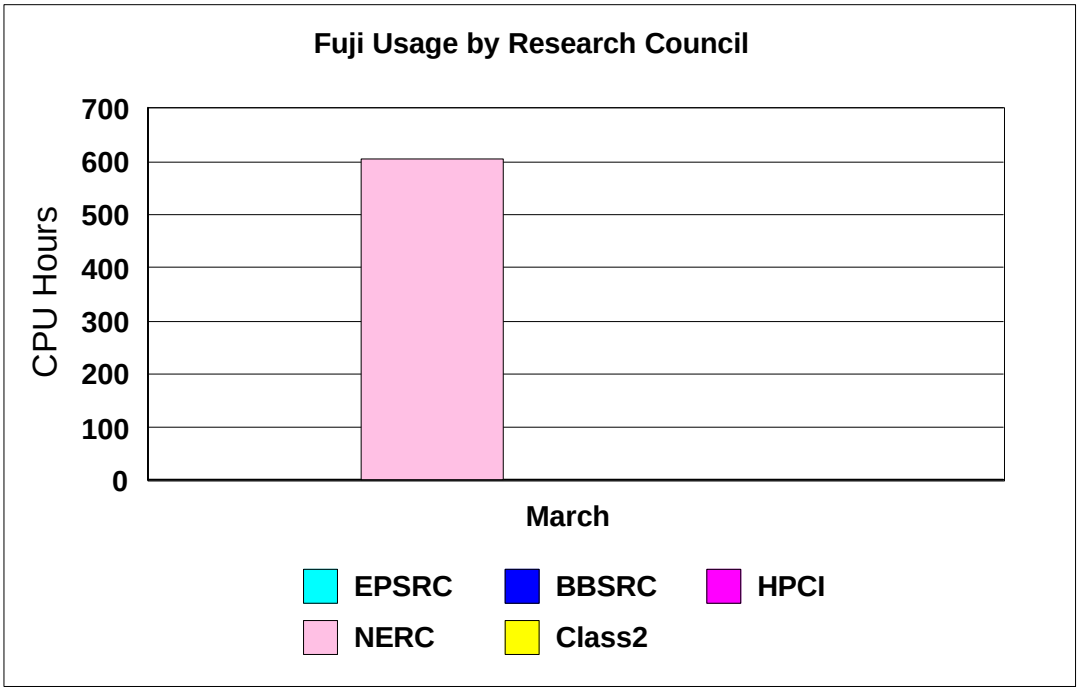

The graph above illustrates the historic allocation of the Medium Performance Disk on Fermat.

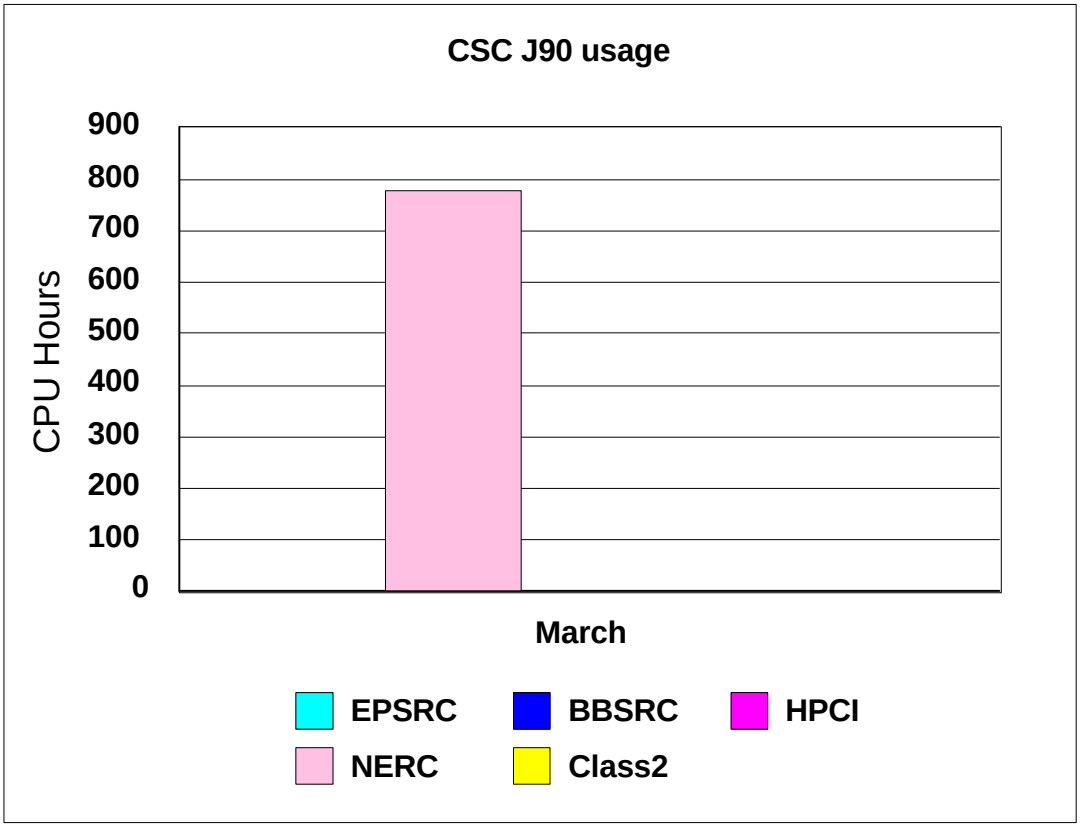
The graph below shows the historic HSM usage by Research Council funded projects. The primary usage is for NERC.



### 4.5 Guest System Usage Charts

The following two graphs show the CPU usage on the current two available CSAR guest systems.



# 5. Service Status, Issues and Plans

## 5.1 Status

This month saw only one system break due to a hardware failure, a T3E power supply failed. However the software upgrade resulted in some unplanned down time which affected the system availability out of core time.

## 5.2 Issues

The system this month has been loaded with 64 PE jobs which has been the predominant size of batch work with a mixture of other work including 128's and 512's towards the end of the month. This was however insufficient to fully load the system for the whole of the month. This resulted in the system running just under baseline.

## 5.3 Plans

The introduction of sub-consortia/projects is continuing with the introduction of the new registration system including this facility being introduced in mid April.

The enhanced Trading Pool and Capacity Planning pages are also to be included in the new release of the registration system.

Testing of the new tape management software is under way on the four 3490 tape drive in the silo, once this software has been evaluated it will be moved to the production system to manage the four SD3 drives.
This will provide the Hierarchical Storage Management, and the backup software with greater flexibility.

The scheduler on Turing is planned to be introduced on Fermat to improve the batch job facilities and better share the resource between the Consortia which have Service Tokens for Fermat CPU usage.

# 6. Conclusion

March 1999 was overall a good month for the Service in regard to Service Quality as we again achieved green on the CPARS scale.

Continued management attention will be given to maximise the throughput of the Service, whilst balancing as fairly as practicable the shares between Projects and jobs of the varying sizes.

**Appendix 1** contains the accounts for March 1999

**Appendix 2** contains the Percentage shares by Consortium for March 1999

**Appendix 3** contains the Percentage shares by Research Council for March 1999

**Appendix 1**

CfS Supercomputer Service

Usage report for Research Council Projects

From Monday 1-Mar-99 to Wednesday 31-Mar-99

| | | CPU Usage (Hours) | | | | | Storage (GB-Years) | | |
|---|---|---|---|---|---|---|---|---|---|
| Account | | Inter | Priority | Normal | Low | Total | D-Usage | D-Allocn | HSM |
| CSE001 Admin users | turing | - | - | - | - | - | 0.00 | 0.01 | - |
| | fermat | - | - | - | - | - | 0.00 | - | - |
| | fuji | - | - | - | - | - | - | - | - |
| | CSCJ90 | - | - | - | - | - | - | - | - |
| Total for Subject EPSRC Administration | turing | - | - | - | - | - | 0.00 | 0.01 | - |
| | fermat | - | - | - | - | - | 0.00 | - | - |
| | fuji | - | - | - | - | - | - | - | - |
| | CSCJ90 | - | - | - | - | - | - | - | - |
| CSE002 gr/m01753 Gillan | turing | 167.82 | 645.19 | 3785.30 | - | 4598.30 | 4.47 | 7.73 | - |
| | fermat | 976.60 | - | - | - | 976.60 | 0.25 | 2.85 | 3.59 |
| | fuji | - | - | - | - | - | - | - | - |
| | CSCJ90 | - | - | - | - | - | - | - | - |
| CSE003 gr/m01784 Taylor | turing | 127.71 | 75.11 | 35821.95 | - | 36024.77 | 0.72 | 2.88 | - |
| | fermat | 400.48 | - | - | - | 400.48 | 0.01 | 2.97 | 0.06 |
| | fuji | - | - | - | - | - | - | - | - |
| | CSCJ90 | - | - | - | - | - | - | - | - |
| CSE007 gr m05348 Foulkes | turing | 15.68 | 32.52 | 32801.50 | 0.00 | 32849.70 | 0.18 | 0.44 | - |
| | fermat | - | - | - | - | - | 0.00 | 0.30 | - |
| | fuji | - | - | - | - | - | - | - | - |
| | CSCJ90 | - | - | - | - | - | - | - | - |
| cse021 GR/L95427 Staunton | turing | 0.23 | - | 77.39 | - | 77.62 | 0.02 | 0.08 | - |
| | fermat | - | - | - | - | - | 0.00 | 0.08 | - |
| | fuji | - | - | - | - | - | - | - | - |
| | CSCJ90 | - | - | - | - | - | - | - | - |
| CSE030 GR/M56234 Cates | turing | 0.08 | - | - | - | 0.08 | 0.00 | 0.12 | - |
| | fermat | - | - | - | - | - | 0.00 | 0.12 | - |
| | fuji | - | - | - | - | - | - | - | - |
| | CSCJ90 | - | - | - | - | - | - | - | - |
| Total for Subject Physics | turing | 311.52 | 752.83 | 72486.13 | 0.00 | 73550.48 | 5.39 | 11.25 | - |
| | fermat | 1377.08 | - | - | - | 1377.08 | 0.26 | 6.33 | 3.65 |
| | fuji | - | - | - | - | - | - | - | - |
| | CSCJ90 | - | - | - | - | - | - | - | - |
| CSE006 gr/m05201 Briddon | turing | 284.26 | 298.92 | 80864.40 | - | 81447.57 | 0.11 | 2.88 | - |
| | fermat | 3.27 | - | - | - | 3.27 | 0.00 | 0.01 | - |
| | fuji | - | - | - | - | - | - | - | - |
| | CSCJ90 | - | - | - | - | - | - | - | - |
| Total for Subject Materials | turing | 284.26 | 298.92 | 80864.40 | - | 81447.57 | 0.11 | 2.88 | - |
| | fermat | 3.27 | - | - | - | 3.27 | 0.00 | 0.01 | - |
| | fuji | - | - | - | - | - | - | - | - |
| | CSCJ90 | - | - | - | - | - | - | - | - |
| CSE004 gr/m08424 Sandham | turing | 170.99 | - | 30397.80 | - | 30568.79 | 1.86 | 3.01 | - |
| | fermat | 0.07 | - | - | - | 0.07 | 0.22 | 2.97 | 3.58 |
| | fuji | - | - | - | - | - | - | - | - |
| | CSCJ90 | - | - | - | - | - | - | - | - |

CfS Supercomputer Service

| Account | | Inter | Priority | Normal | Low | Total | D-Usage | D-Allocn | HSM |
|---|---|---|---|---|---|---|---|---|---|
| | | ---------- CPU Usage (Hours) ---------- | | | | | --- Storage (GB-Years) --- | | |
| CSE010 gr/l04108 Williams | turing | - | - | - | - | - | 0.00 | 0.04 | - |
| | fermat | - | - | - | - | - | 0.00 | 0.04 | - |
| | fuji | - | - | - | - | - | - | - | - |
| | CSCJ90 | - | - | - | - | - | - | - | - |
| CSE011 gr/k52317 Williams | turing | 0.03 | 25.39 | 521.96 | - | 547.38 | 0.77 | 3.29 | - |
| | fermat | - | - | - | - | - | 0.00 | 0.04 | - |
| | fuji | - | - | - | - | - | - | - | - |
| | CSCJ90 | - | - | - | - | - | - | - | - |
| cse013 gr/k43902 Leschzine | turing | - | - | - | - | - | 0.00 | 0.82 | - |
| | fermat | 34.53 | - | - | - | 34.53 | 0.00 | 0.85 | - |
| | fuji | - | - | - | - | - | - | - | - |
| | CSCJ90 | - | - | - | - | - | - | - | - |
| cse014 GR/K73466 Goddard | turing | 0.00 | - | - | - | 0.00 | 0.00 | 0.08 | - |
| | fermat | - | - | - | - | - | 0.00 | - | - |
| | fuji | - | - | - | - | - | - | - | - |
| | CSCJ90 | - | - | - | - | - | - | - | - |
| CSE016 GR/K96519 Cant | turing | - | - | - | - | - | 0.00 | 0.00 | - |
| | fermat | - | - | - | - | - | 0.00 | 0.00 | - |
| | fuji | - | - | - | - | - | - | - | - |
| | CSCJ90 | - | - | - | - | - | - | - | - |
| cse017 GR/L58699 Luo | turing | 5.49 | 0.96 | 22432.16 | - | 22438.61 | 0.23 | 0.36 | - |
| | fermat | 0.05 | - | - | - | 0.05 | 0.03 | 0.17 | 0.62 |
| | fuji | - | - | - | - | - | - | - | - |
| | CSCJ90 | - | - | - | - | - | - | - | - |
| cse018 GR/L68353 Cant | turing | - | - | - | - | - | 0.00 | 0.00 | - |
| | fermat | - | - | - | - | - | 0.00 | 0.00 | - |
| | fuji | - | - | - | - | - | - | - | - |
| | CSCJ90 | - | - | - | - | - | - | - | - |
| cse022 GR/L98527 Jones | turing | - | - | - | - | - | 0.02 | 0.82 | - |
| | fermat | - | - | - | - | - | 0.00 | - | - |
| | fuji | - | - | - | - | - | - | - | - |
| | CSCJ90 | - | - | - | - | - | - | - | - |
| Total for Subject Engineering | turing | 176.52 | 26.35 | 53351.92 | - | 53554.79 | 2.88 | 8.43 | - |
| | fermat | 34.65 | - | - | - | 34.65 | 0.26 | 4.07 | 4.20 |
| | fuji | - | - | - | - | - | - | - | - |
| | CSCJ90 | - | - | - | - | - | - | - | - |
| CSE008 GR/M07624 Hillier | turing | 2.59 | - | 49583.78 | - | 49586.37 | 0.01 | 0.05 | - |
| | fermat | - | - | - | - | - | 0.00 | 0.00 | - |
| | fuji | - | - | - | - | - | - | - | - |
| | CSCJ90 | - | - | - | - | - | - | - | - |
| CSE009 gr/m07441 Catlow | turing | 306.09 | 2475.59 | 23407.61 | - | 26189.29 | 1.04 | 6.58 | - |
| | fermat | 1430.75 | - | - | - | 1430.75 | 0.01 | 0.85 | - |
| | fuji | - | - | - | - | - | - | - | - |
| | CSCJ90 | - | - | - | - | - | - | - | - |
| cse024 GR/M44453 Tennyson | turing | 76.02 | 3769.32 | 0.04 | - | 3845.39 | 0.05 | 2.88 | - |
| | fermat | 6.72 | - | - | - | 6.72 | 0.00 | 2.97 | - |
| | fuji | 0.95 | - | - | - | 0.95 | - | - | - |
| | CSCJ90 | - | - | - | - | - | - | - | - |
| Chemistry | turing | 384.71 | 6244.91 | 72991.43 | - | 79621.05 | 1.10 | 9.51 | - |
| | fermat | 1437.47 | - | - | - | 1437.47 | 0.01 | 3.83 | - |
| | fuji | 0.95 | - | - | - | 0.95 | - | - | - |
| | CSCJ90 | - | - | - | - | - | - | - | - |
| CSE019 cr/l73104 Berzins | turing | 0.40 | - | 316.04 | - | 316.44 | 0.02 | 0.08 | - |
| | fermat | - | - | - | - | - | 0.00 | 0.08 | - |
| | fuji | - | - | - | - | - | - | - | - |
| | CSCJ90 | - | - | - | - | - | - | - | - |
| Total for Subject Information Technology | turing | 0.40 | - | 316.04 | - | 316.44 | 0.02 | 0.08 | - |
| | fermat | - | - | - | - | - | 0.00 | 0.08 | - |
| | fuji | - | - | - | - | - | - | - | - |
| | CSCJ90 | - | - | - | - | - | - | - | - |
| Total for Council EPSRC | turing | 1157.41 | 7323.00 | 280009 | 0.00 | 288490 | 9.50 | 32.15 | - |
| | fermat | 2852.47 | - | - | - | 2852.47 | 0.53 | 14.32 | 7.85 |
| | fuji | 0.95 | - | - | - | 0.95 | - | - | - |
| | CSCJ90 | - | - | - | - | - | - | - | - |

CfS Supercomputer Service

| Account | | Inter Priority | Normal | Low | Total | D-Usage | D-Allocn | HSM |
|---|---|---|---|---|---|---|---|---|
| | | ---------- CPU Usage (Hours) ---------- | | | | --- Storage (GB-Years) --- | | |
| HPCI Southampton | turing | 0.01 | - | - | 0.01 | 0.14 | 4.93 | - |
| | fermat | 0.03 | - | - | 0.03 | 0.08 | 0.08 | - |
| | fuji | - | - | - | - | - | - | - |
| | CSCJ90 | - | - | - | - | - | - | - |
| HPCI Daresbury | turing | 5.18 | 45.79 | - | 50.97 | 0.02 | 0.08 | - |
| | fermat | - | - | - | - | 0.00 | 0.08 | - |
| | fuji | - | - | - | - | - | - | - |
| | CSCJ90 | - | - | - | - | - | - | - |
| HPCI Edinburgh | turing | 0.00 | - | - | 0.00 | 0.00 | 0.08 | - |
| | fermat | 34.70 | - | - | 34.70 | 0.01 | - | - |
| | fuji | - | - | - | - | - | - | - |
| | CSCJ90 | - | - | - | - | - | - | - |
| Total for Council | | | | | | | | |
| HPCI | turing | 5.19 | 45.79 | - | 50.98 | 0.16 | 5.10 | - |
| | fermat | 34.73 | - | - | 34.73 | 0.08 | 0.17 | - |
| | fuji | - | - | - | - | - | - | - |
| | CSCJ90 | - | - | - | - | - | - | - |
| csn001 SOC Core Strategic | turing | 6.49 | 74.24 | 763.58 | - | 844.31 | 1.91 | 4.11 | - |
| | fermat | 1005.22 | - | - | - | 1005.22 | 0.18 | 4.25 | 22.89 |
| | fuji | - | - | - | - | - | - | - | - |
| | CSCJ90 | - | - | - | - | - | - | - | - |
| csn002 gr3.10789 Hillier | turing | 0.00 | - | - | - | 0.00 | 0.00 | 0.06 | - |
| | fermat | - | - | - | - | - | - | 0.08 | - |
| | fuji | - | - | - | - | - | - | - | - |
| | CSCJ90 | - | - | - | - | - | - | - | - |
| badc | turing | - | - | - | - | - | - | - | - |
| | fermat | 2.88 | - | - | - | 2.88 | 2.24 | - | 68.16 |
| | fuji | - | - | - | - | - | - | - | - |
| | CSCJ90 | - | - | - | - | - | - | - | - |
| csn003 UGAMP O'Neill | turing | 23.43 | 189.51 | 11196.71 | - | 11409.64 | 0.40 | 0.58 | - |
| | fermat | 3.25 | - | - | - | 3.25 | 0.03 | 0.59 | 106.24 |
| | fuji | 606.97 | - | - | - | 606.97 | - | - | - |
| | CSCJ90 | 0.12 | 0.61 | 776.32 | - | 777.05 | - | - | - |
| csn005 GR9/2909 Davies | turing | 1.24 | - | 2441.67 | - | 2442.91 | 0.72 | 1.64 | - |
| | fermat | - | - | - | - | - | 0.00 | 0.01 | - |
| | fuji | - | - | - | - | - | - | - | - |
| | CSCJ90 | - | - | - | - | - | - | - | - |
| csn006 GR9/3550 Price | turing | 141.78 | - | 10714.11 | - | 10855.89 | 0.20 | 2.22 | - |
| | fermat | - | - | - | - | - | 0.00 | - | - |
| | fuji | - | - | - | - | - | - | - | - |
| | CSCJ90 | - | - | - | - | - | - | - | - |
| csn007 GST/02/1454 Price | turing | 9.02 | - | 10548.45 | - | 10557.47 | 0.05 | 0.33 | - |
| | fermat | - | - | - | - | - | 0.00 | 0.00 | - |
| | fuji | - | - | - | - | - | - | - | - |
| | CSCJ90 | - | - | - | - | - | - | - | - |
| CSN011 GST/02/1889 Thorpe | turing | 0.05 | - | - | - | 0.05 | 0.01 | 0.02 | - |
| | fermat | - | - | - | - | - | - | - | - |
| | fuji | - | - | - | - | - | - | - | - |
| | CSCJ90 | - | - | - | - | - | - | - | - |
| Total for Council | | | | | | | | |
| NERC | turing | 181.99 | 263.75 | 35664.53 | - | 36110.27 | 3.28 | 8.95 | - |
| | fermat | 1011.35 | - | - | - | 1011.35 | 2.45 | 4.93 | 197.29 |
| | fuji | 606.97 | - | - | - | 606.97 | - | - | - |
| | CSCJ90 | 0.12 | 0.61 | 776.32 | - | 777.05 | - | - | - |
| CSB001 27/B07117 Goodfello | turing | - | - | - | - | - | 0.00 | 0.99 | - |
| | fermat | - | - | - | - | - | 0.00 | 1.02 | - |
| | fuji | - | - | - | - | - | - | - | - |
| | CSCJ90 | - | - | - | - | - | - | - | - |
| CSB002 86/B10059 Danson | turing | 0.00 | - | - | - | 0.00 | 0.02 | 2.05 | - |
| | fermat | - | - | - | - | - | 0.00 | - | - |
| | fuji | - | - | - | - | - | - | - | - |
| | CSCJ90 | - | - | - | - | - | - | - | - |
| CSB003 117/SO9645 Williams | turing | 0.02 | - | - | - | 0.02 | 0.01 | 0.03 | - |
| | fermat | - | - | - | - | - | 0.00 | 0.00 | - |
| | fuji | - | - | - | - | - | - | - | - |
| | CSCJ90 | - | - | - | - | - | - | - | - |
| Total for Council | | | | | | | | |
| BBSRC | turing | 0.02 | - | - | - | 0.02 | 0.02 | 3.07 | - |
| | fermat | - | - | - | - | - | 0.00 | 1.02 | - |
| | fuji | - | - | - | - | - | - | - | - |
| | CSCJ90 | - | - | - | - | - | - | - | - |
| cs2001 CompApps3D Jain | turing | - | - | - | - | - | 0.00 | 0.04 | - |
| | fermat | - | - | - | - | - | 0.00 | - | - |
| | fuji | - | - | - | - | - | - | - | - |
| | CSCJ90 | - | - | - | - | - | - | - | - |
| cs2003 GST/02/0760 Coultha | turing | - | - | - | - | - | - | - | - |
| | fermat | 390.35 | - | - | - | 390.35 | 0.02 | 0.17 | - |
| | fuji | - | - | - | - | - | - | - | - |
| | CSCJ90 | - | - | - | - | - | - | - | - |
| Total for Council | | | | | | | | |
| Class 2 | turing | - | - | - | - | - | 0.00 | 0.04 | - |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | fermat | 390.35 | - | - | - | 390.35 | 0.02 | 0.17 | - |
| | fuji | - | - | - | - | - | - | - | - |
| | CSCJ90 | - | - | - | - | - | - | - | - |

CfS Supercomputer Service

| | | CPU Usage (Hours) | | | | | Storage (GB-Years) | | |
|---|---|---|---|---|---|---|---|---|---|
| Account | | Inter | Priority | Normal | Low | Total | D-Usage | D-Allocn | HSM |
| euukcp | turing | - | - | - | - | - | 1.06 | - | - |
| | fermat | - | - | - | - | - | - | - | - |
| | fuji | - | - | - | - | - | - | - | - |
| | CSCJ90 | - | - | - | - | - | - | - | - |
| eugamp | turing | - | - | - | - | - | 0.04 | - | - |
| | fermat | - | - | - | - | - | - | - | - |
| | fuji | - | - | - | - | - | - | - | - |
| | CSCJ90 | - | - | - | - | - | - | - | - |
| euqub | turing | 0.00 | - | - | - | 0.00 | 0.00 | - | - |
| | fermat | - | - | - | - | - | - | - | - |
| | fuji | - | - | - | - | - | - | - | - |
| | CSCJ90 | - | - | - | - | - | - | - | - |
| euocam | turing | - | - | - | - | - | 0.13 | - | - |
| | fermat | - | - | - | - | - | - | - | - |
| | fuji | - | - | - | - | - | - | - | - |
| | CSCJ90 | - | - | - | - | - | - | - | - |
| euqmw | turing | - | - | - | - | - | 2.76 | - | - |
| | fermat | - | - | - | - | - | - | - | - |
| | fuji | - | - | - | - | - | - | - | - |
| | CSCJ90 | - | - | - | - | - | - | - | - |
| euhpci | turing | - | - | - | - | - | 0.18 | - | - |
| | fermat | - | - | - | - | - | - | - | - |
| | fuji | - | - | - | - | - | - | - | - |
| | CSCJ90 | - | - | - | - | - | - | - | - |
| euston | turing | - | - | - | - | - | 0.03 | - | - |
| | fermat | - | - | - | - | - | - | - | - |
| | fuji | - | - | - | - | - | - | - | - |
| | CSCJ90 | - | - | - | - | - | - | - | - |
| eural | turing | 0.00 | - | - | - | 0.00 | 1.85 | - | - |
| | fermat | - | - | - | - | - | - | - | - |
| | fuji | - | - | - | - | - | - | - | - |
| | CSCJ90 | - | - | - | - | - | - | - | - |
| eubbk | turing | - | - | - | - | - | 0.08 | - | - |
| | fermat | - | - | - | - | - | - | - | - |
| | fuji | - | - | - | - | - | - | - | - |
| | CSCJ90 | - | - | - | - | - | - | - | - |
| earlyu | turing | - | - | - | - | - | - | - | - |
| | fermat | - | - | - | - | - | 0.11 | - | 1.84 |
| | fuji | - | - | - | - | - | - | - | - |
| | CSCJ90 | - | - | - | - | - | - | - | - |
| dummy | turing | - | - | - | - | - | 0.00 | - | - |
| | fermat | - | - | - | - | - | 0.00 | - | - |
| | fuji | - | - | - | - | - | - | - | - |
| | CSCJ90 | - | - | - | - | - | - | - | - |
| Total for Subject eu accounts | turing | 0.00 | - | - | - | 0.00 | 6.14 | - | - |
| | fermat | - | - | - | - | - | 0.11 | - | 1.84 |
| | fuji | - | - | - | - | - | - | - | - |
| | CSCJ90 | - | - | - | - | - | - | - | - |
| Total for Council Research | turing | 0.00 | - | - | - | 0.00 | 6.14 | - | - |
| | fermat | - | - | - | - | - | 0.11 | - | 1.84 |
| | fuji | - | - | - | - | - | - | - | - |
| | CSCJ90 | - | - | - | - | - | - | - | - |

Usage report for All Research Councils

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Total Research Councils | turing | 1344.61 | 7632.54 | 315674 | 0.00 | 324651 | 19.12 | 49.31 | - |
| | fermat | 4288.90 | - | - | - | 4288.90 | 3.19 | 20.61 | 206.99 |
| | fuji | 607.92 | - | - | - | 607.92 | - | - | - |
| | CSCJ90 | 0.12 | 0.61 | 776.32 | - | 777.05 | - | - | - |

**Appendix 2**

**Percentage PE time per consortia for Turing in March 1999**

| Consortia | % Machine Time |
|---|---|
| CSE002 | 1.42 |
| CSE003 | 11.10 |
| CSE007 | 10.12 |
| CSE021 | 0.02 |
| CSE030 | 0.00 |
| CSE006 | 25.09 |
| CSE004 | 9.42 |
| CSE010 | 0 |
| CSE011 | 0.17 |
| CSE013 | 0 |
| CSE014 | 0 |
| CSE016 | 0 |
| CSE017 | 6.91 |
| CSE018 | 0 |
| CSE022 | 0.00 |
| CSE008 | 15.27 |
| CSE009 | 8.07 |
| CSE024 | 1.18 |
| CSE019 | 0.00 |
| HPCI Southampton | 0.00 |
| HPCI Daresbury | 0.02 |
| HPCI Edinburgh | 0 |
| CSN001 | 0.26 |
| CSN002 | 0 |
| BADC | 0 |
| CSN003 | 3.51 |
| CSN005 | 0.75 |
| CSN006 | 3.34 |
| CSN007 | 3.25 |
| CSN011 | 0.00 |
| CSB001 | 0 |
| CSB002 | 0.00 |
| CSB003 | 0.00 |
| CS2001 | 0 |
| CS2003 | 0 |

**Percentage CPU time per consortia for Fermat in March 1999**

| Consortia | % Machine Time |
|---|---|
| CSE002 | 22.77 |
| CSE003 | 9.34 |
| CSE007 | 0.00 |
| CSE021 | 0.00 |
| CSE030 | 0.00 |
| CSE006 | 0.08 |
| CSE004 | 0.00 |
| CSE010 | 0.00 |
| CSE011 | 0.00 |
| CSE013 | 0.81 |
| CSE014 | 0.00 |
| CSE016 | 0.00 |
| CSE017 | 0.00 |
| CSE018 | 0.00 |
| CSE022 | 0.00 |
| CSE008 | 0.00 |
| CSE009 | 33.36 |
| CSE024 | 0.16 |
| CSE019 | 0.00 |
| HPCI Southampton | 0.00 |
| HPCI Daresbury | 0.00 |
| HPCI Edinburgh | 0.81 |
| CSN001 | 23.44 |
| CSN002 | 0.00 |
| BADC | 0.07 |
| CSN003 | 14.15 |
| CSN005 | 0.00 |
| CSN006 | 0.00 |
| CSN007 | 0.00 |
| CSN011 | 0.00 |
| CSB001 | 0.00 |
| CSB002 | 0.00 |
| CSB003 | 0.00 |
| CS2001 | 0.00 |
| CS2003 | 9.10 |

**Percentage disc allocation by Consortia for Turing in March 1999**

| Consortia | %Allocation |
|---|---|
| CSE002 | 15.68 |
| CSE003 | 0.06 |
| CSE007 | 0.89 |
| CSE021 | 0.16 |
| CSE030 | 0.24 |
| CSE006 | 5.84 |
| CSE004 | 6.10 |
| CSE010 | 0.08 |
| CSE011 | 6.67 |
| CSE013 | 1.66 |
| CSE014 | 0.16 |
| CSE016 | 0.00 |
| CSE017 | 0.73 |
| CSE018 | 0.00 |
| CSE022 | 1.66 |
| CSE008 | 0.10 |
| CSE009 | 13.34 |
| CSE024 | 5.84 |
| CSE019 | 0.16 |
| HPCI Southampton | 10.00 |
| HPCI Daresbury | 0.16 |
| HPCI Edinburgh | 0.16 |
| CSN001 | 8.34 |
| CSN002 | 0.12 |
| BADC | 0.00 |
| CSN003 | 1.18 |
| CSN005 | 3.33 |
| CSN006 | 4.50 |
| CSN007 | 0.67 |
| CSN011 | 0.04 |
| CSB001 | 2.01 |
| CSB002 | 4.16 |
| CSB003 | 0.06 |
| CS2001 | 0.00 |
| CS2003 | 0.00 |

**Percentage disc allocation by Consortia for Fermat in March 1999**

| Consortia | %Allocation |
|---|---|
| CSE002 | 13.83 |
| CSE003 | 14.41 |
| CSE007 | 1.46 |
| CSE021 | 0.39 |
| CSE030 | 0.58 |
| CSE006 | 0.05 |
| CSE004 | 14.41 |
| CSE010 | 0.19 |
| CSE011 | 0.19 |
| CSE013 | 4.12 |
| CSE014 | 0.00 |
| CSE016 | 0.00 |
| CSE017 | 0.82 |
| CSE018 | 0.00 |
| CSE022 | 0.00 |
| CSE008 | 0.00 |
| CSE009 | 4.12 |
| CSE024 | 14.41 |
| CSE019 | 0.39 |
| HPCI Southampton | 0.39 |
| HPCI Daresbury | 0.39 |
| HPCI Edinburgh | 0.00 |
| CSN001 | 20.62 |
| CSN002 | 0.39 |
| BADC | 0.00 |
| CSN003 | 2.86 |
| CSN005 | 0.05 |
| CSN006 | 0.00 |
| CSN007 | 0.00 |
| CSN011 | 0.00 |
| CSB001 | 4.95 |
| CSB002 | 0.00 |
| CSB003 | 0.00 |
| CS2001 | 0.00 |
| CS2003 | 0.82 |

**Appendix 2**

Percentage usage of HSM by Consortium for March 1999

| Consortium | % Usage |
|---|---|
| CSE002 | 1.73 |
| CSE003 | 0 |
| CSE007 | 0 |
| CSE021 | 0 |
| CSE006 | 0 |
| CSE004 | 1.73 |
| CSE010 | 0 |
| CSE011 | 0 |
| CSE013 | 0 |
| CSE016 | 0 |
| CSE017 | 0.30 |
| CSE018 | 0 |
| CSE022 | 0 |
| CSE008 | 0 |
| CSE009 | 0 |
| CSE024 | 0 |
| CSE019 | 0 |
| HPCI Southampton | 0 |
| HPCI Daresbury | 0 |
| HPCI Edinburgh | 0 |
| CSN001 | 11.06 |
| CSN002 | 0 |
| CSN003 & BADC | 84.26 |
| CSN005 | 0 |
| CSN006 | 0 |
| CSN007 | 0 |
| CSB001 | 0 |
| CSB002 | 0 |
| CS2001 | 0 |
| CS2003 | 0 |

**Appendix 3**

| Percentage PE usage on Turing by Reserch Council for March 1999 | | | Percentage CPU usage on Fermat by Reserch Council for March 1999 | | |
|---|---|---|---|---|---|
| **Research Coucil** | **% Usage** | | **Research Coucil** | **% Usage** | |
| EPSRC | 88.86 | | EPSRC | 66.51 | |
| HPCI | 0.016 | | HPCI | 0.81 | |
| NERC | 11.12 | | NERC | 23.58 | |
| BBSRC | 0 | | BBSRC | 0 | |
| Class2 | 0 | | Class2 | 9.10 | |

| Percentage Disc allocated on Turing by Research Council for March 1999 | | | Percentage Disc allocated on Fermat by Research Council for March 1999 | | |
|---|---|---|---|---|---|
| **Research Council** | **% Allocated** | | **Research Council** | **% Allocated** | |
| EPSRC | 65.20 | | EPSRC | 69.48 | |
| HPCI | 10.34 | | HPCI | 0.82 | |
| NERC | 18.15 | | NERC | 23.92 | |
| BBSRC | 6.23 | | BBSRC | 4.95 | |
| Class2 | 0.08 | | Class2 | 0.82 | |

| **Percentage HSM usage by Research Council for March 1999** | | |
|---|---|---|
| **Research Council** | **% usage** | |
| EPSRC | 3.79 | |
| HPCI | 0 | |
| NERC | 95.31 | |
| BBSRC | 0 | |
| Class2 | 0 | |