

# **The Bennett Group, Inc.**

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## **Prudential Service Company IIG Client Service Office Application Review**



# Objectives of the IIG CSO Study

## *Objectives:*

- ◆ Decreasing batch run time
- ◆ Improving on-line availability and response time
- ◆ Adding and/or improving fault tolerance, including identification of options to eliminate or minimize single points of failure
- ◆ Identification of options to enhance Business Continuation

## *Assumptions:*

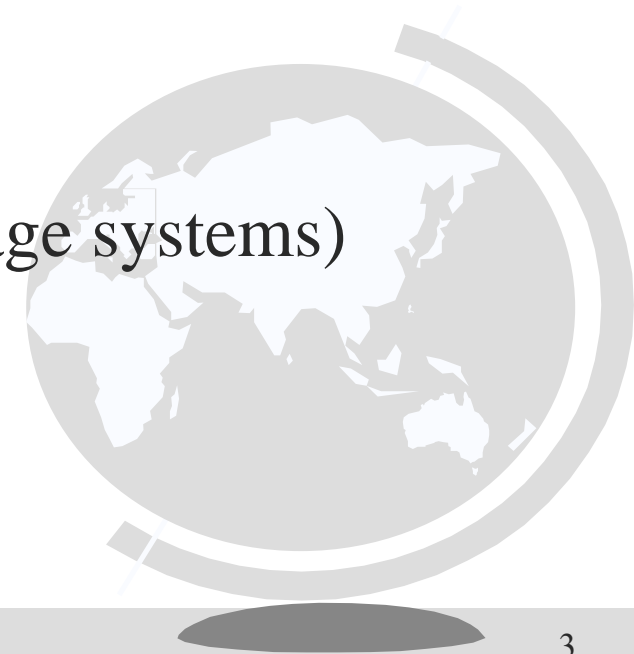
- ◆ The application set cannot be changed.
- ◆ Source code corrections or alterations are not to be considered.
- ◆ Network (VTAM, NCP and SNA architectures) are not included.



# Executive Summary

Findings and Recommendations are summarized into four general categories:

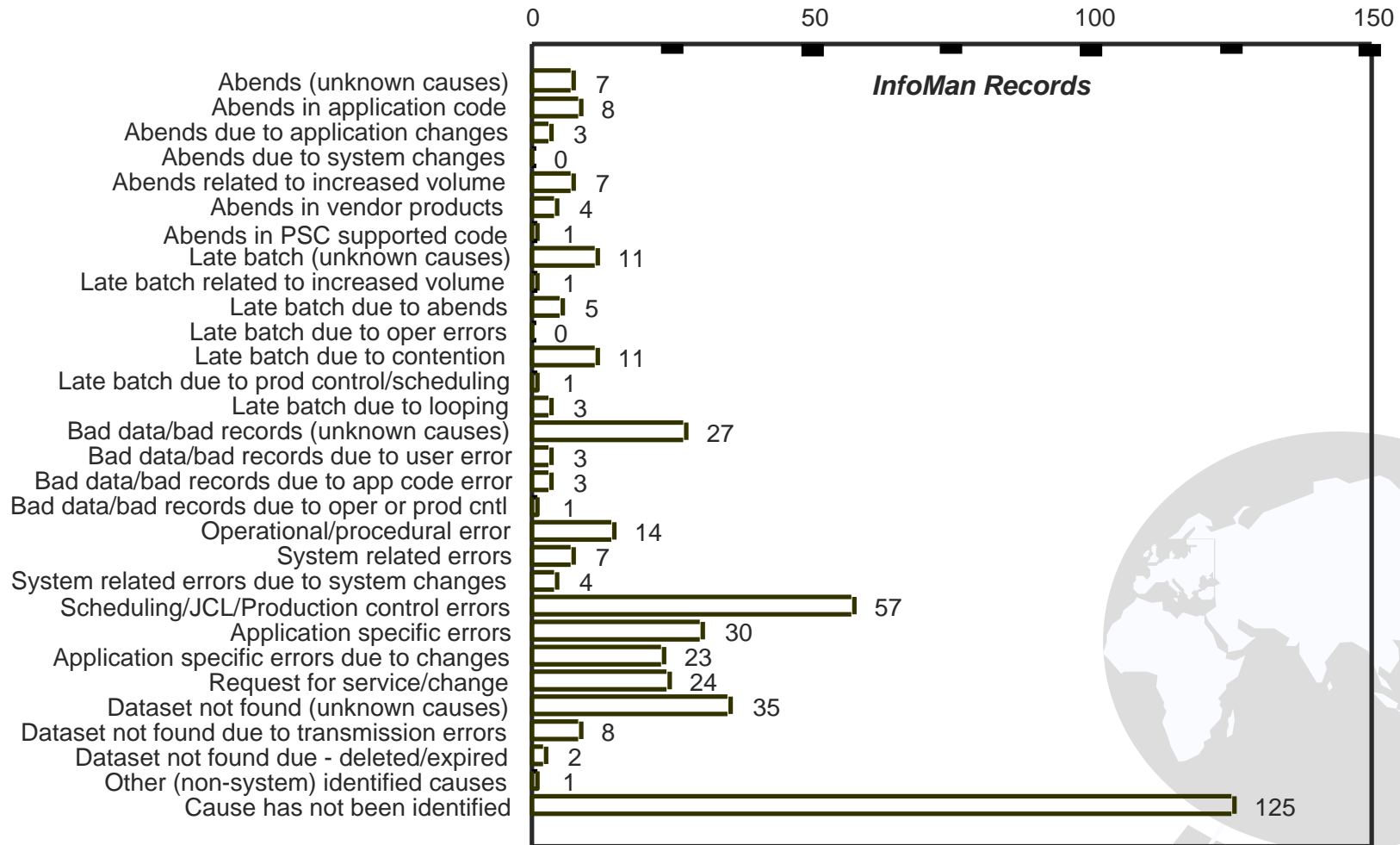
- ◆ Batch processing
- ◆ On-line (CICS) processing
- ◆ Hardware configuration (CPU and storage systems)
- ◆ Management Issues



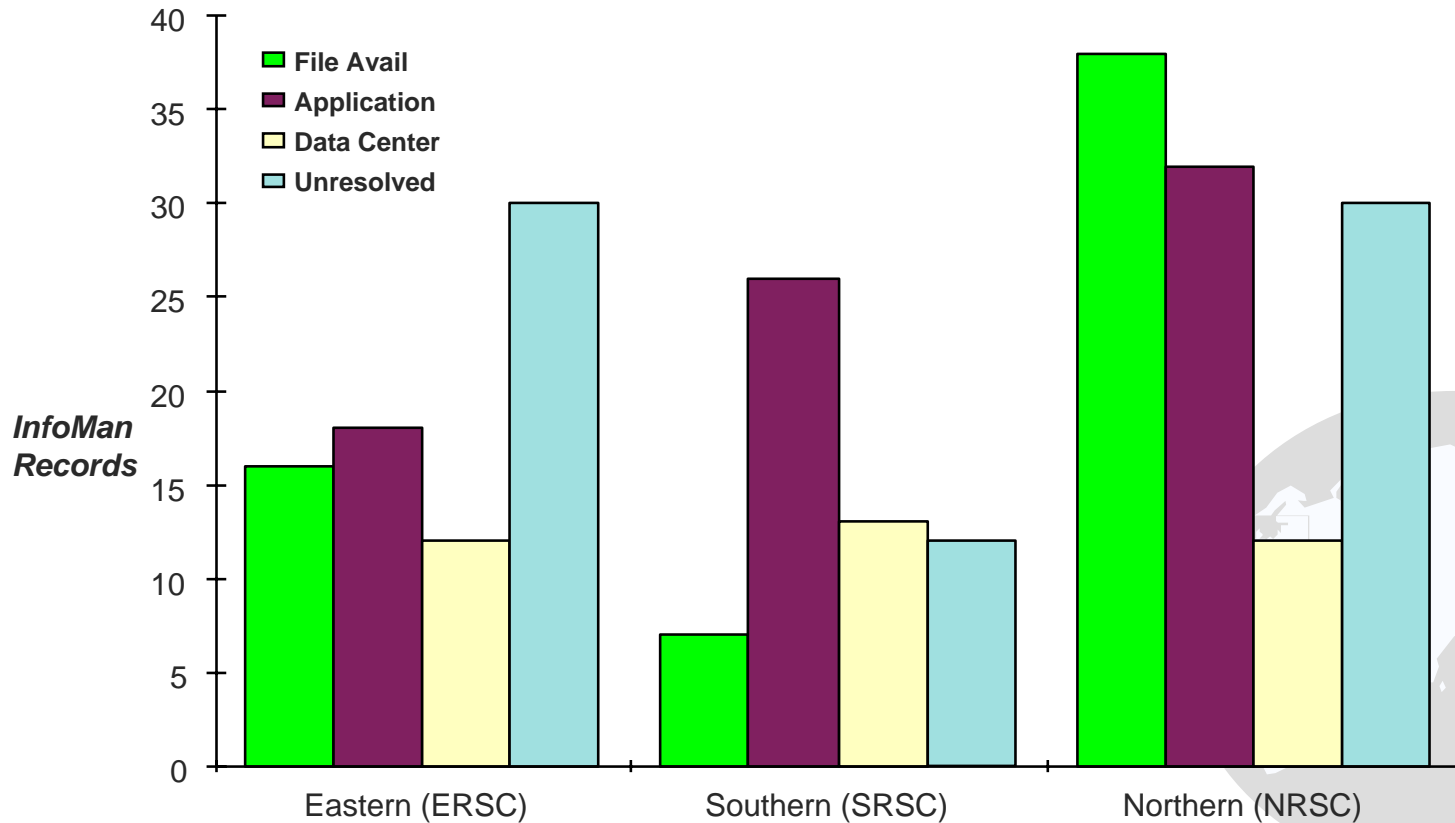
# Batch Error Findings

Cause Description	December			January			February			Totals		
	Open Records	Closed Records	Total Records	Open Records	Closed Records	Total Records	Open Records	Closed Records	Total Records	Open Records	Closed Records	Total Records
Abends (unknown causes)	0	3	3	4	0	4	0	0	0	4	3	7
Abends in application code	0	1	1	1	3	4	3	0	3	4	4	8
Abends due to application changes	0	0	0	0	3	3	0	0	0	0	3	3
Abends due to system changes	0	0	0	0	0	0	0	0	0	0	0	0
Abends related to increased volume	0	6	6	0	1	1	0	0	0	0	7	7
Abends in vendor products	1	1	2	1	0	1	1	0	1	3	1	4
Abends in PSC supported code	0	0	0	0	0	0	1	0	1	1	0	1
Late batch (unknown causes)	2	2	4	0	1	1	1	5	6	3	8	11
Late batch related to increased volume	0	1	1	0	0	0	0	0	0	0	1	1
Late batch due to abends	0	3	3	1	1	2	0	0	0	1	4	5
Late batch due to oper errors	0	0	0	0	0	0	0	0	0	0	0	0
Late batch due to contention	1	6	7	0	3	3	0	1	1	1	10	11
Late batch due to prod control/scheduling	0	0	0	0	1	1	0	0	0	0	1	1
Late batch due to looping	2	0	2	0	0	0	1	0	1	3	0	3
Bad data/bad records (unknown causes)	4	7	11	3	7	10	3	3	6	10	17	27
Bad data/bad records due to user error	0	0	0	0	0	0	1	2	3	1	2	3
Bad data/bad records due to app code error	0	1	1	0	2	2	0	0	0	0	3	3
Bad data/bad records due to oper or prod ctrl	0	1	1	0	0	0	0	0	0	0	1	1
Operational/procedural error	1	8	9	1	1	2	2	1	3	4	10	14
System related errors	0	1	1	4	2	6	0	0	0	4	3	7
System related errors due to system changes	0	0	0	2	2	4	0	0	0	2	2	4
Scheduling/JCL/Production control errors	3	28	31	8	13	21	3	2	5	14	43	57
Application specific errors	1	10	11	7	11	18	0	1	1	8	22	30
Application specific errors due to changes	2	15	17	0	6	6	0	0	0	2	21	23
Request for service/change	3	4	7	12	5	17	0	0	0	15	9	24
Dataset not found (unknown causes)	1	29	30	0	0	0	4	1	5	5	30	35
Dataset not found due to transmission errors	1	4	5	0	1	1	2	0	2	3	5	8
Dataset not found due - deleted/expired	0	1	1	0	1	1	0	0	0	0	2	2
Other (non-system) identified causes	0	0	0	0	0	0	0	1	1	0	1	1
Cause has not been identified	13	32	45	24	38	62	11	7	18	48	77	125
<b>Totals</b>	<b>35</b>	<b>164</b>	<b>199</b>	<b>68</b>	<b>102</b>	<b>170</b>	<b>33</b>	<b>24</b>	<b>57</b>	<b>136</b>	<b>290</b>	<b>426</b>

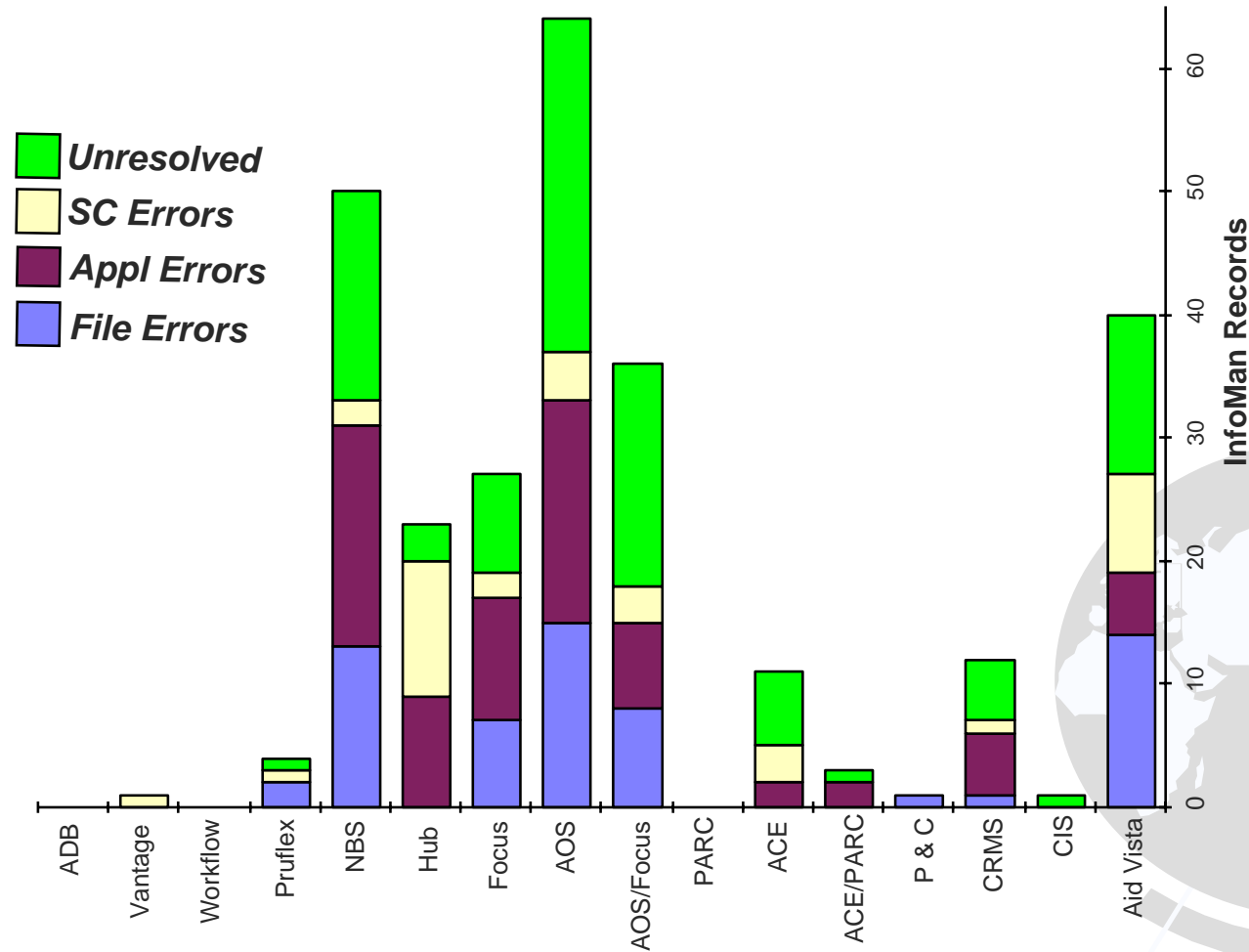
# Batch Problem Records by Category



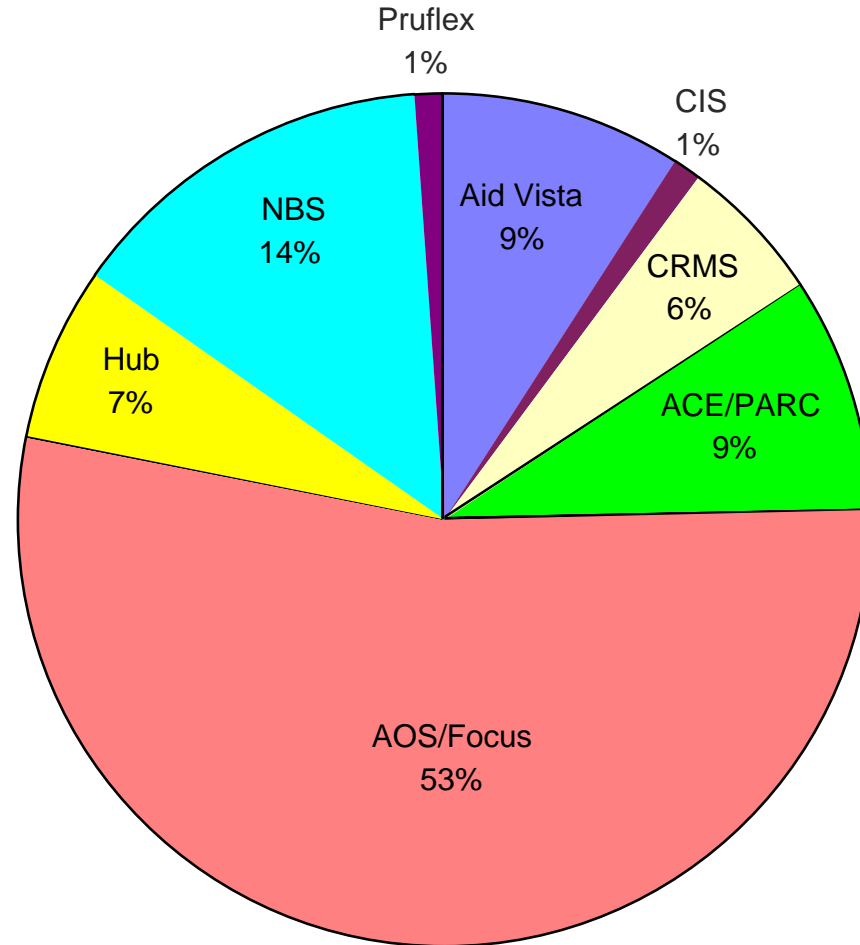
# File Availability is a serious problem in NRSC, but SRSC and ERSC have more application related CSO batch problems.



# AOS and NBS are at the top of the charts for CICS error frequency.



# Unresolved (unclosed) InfoMan records are a concern. About 1/3 of all problems are still open.

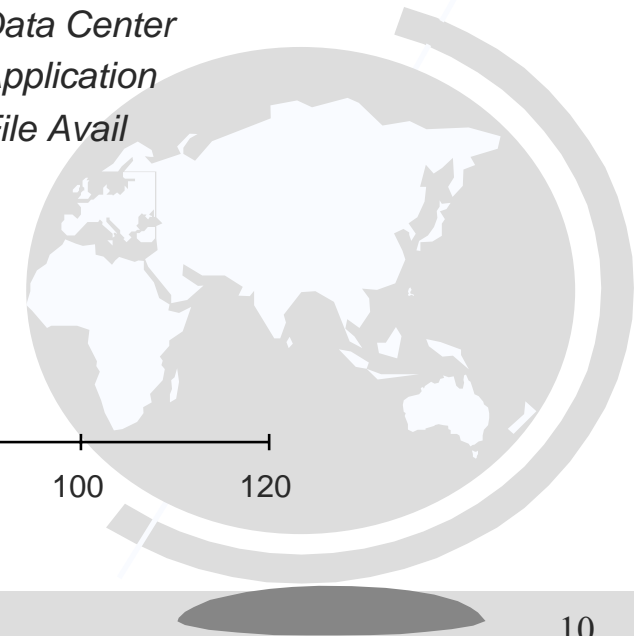
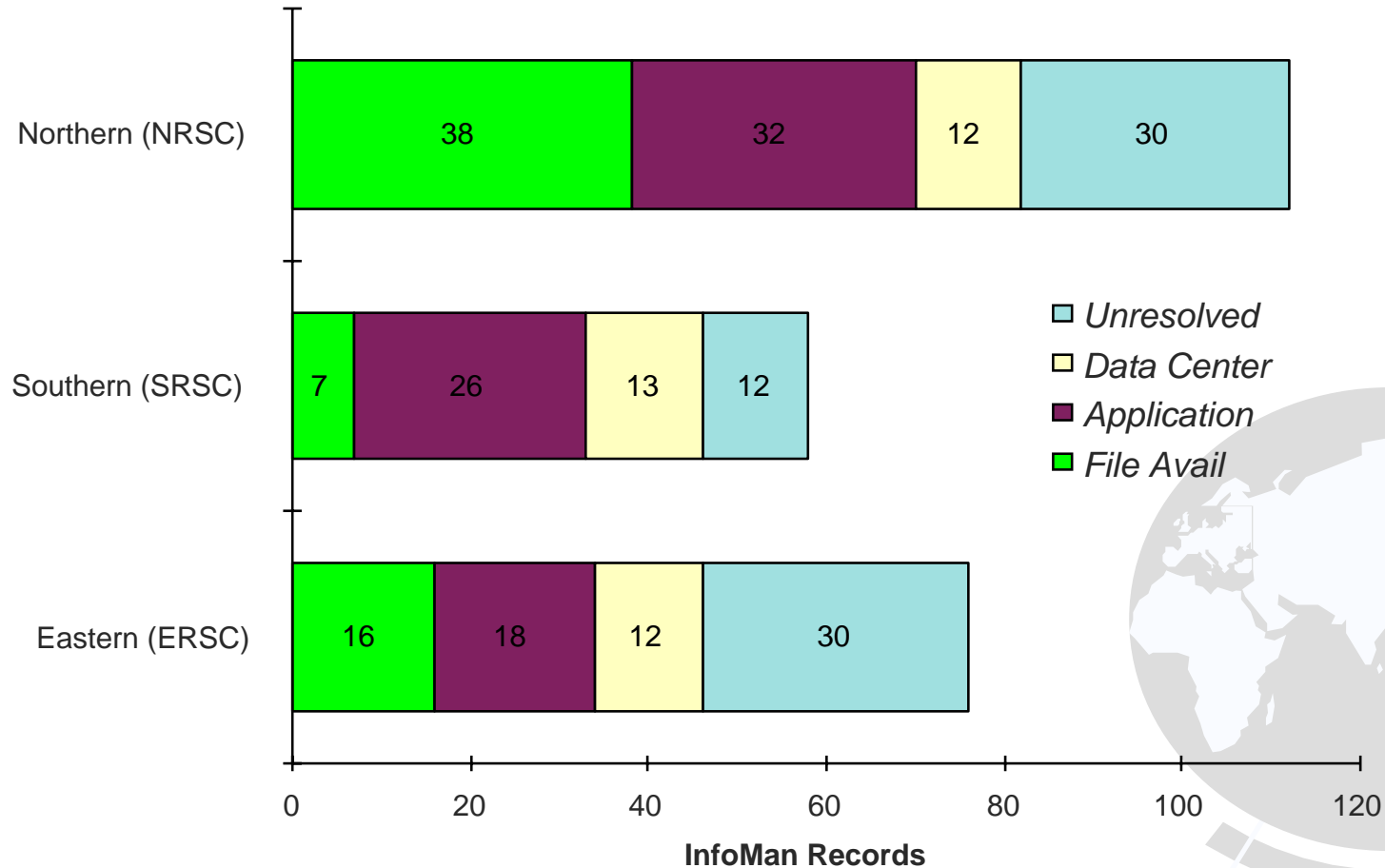


# Batch Problem Analysis Summary

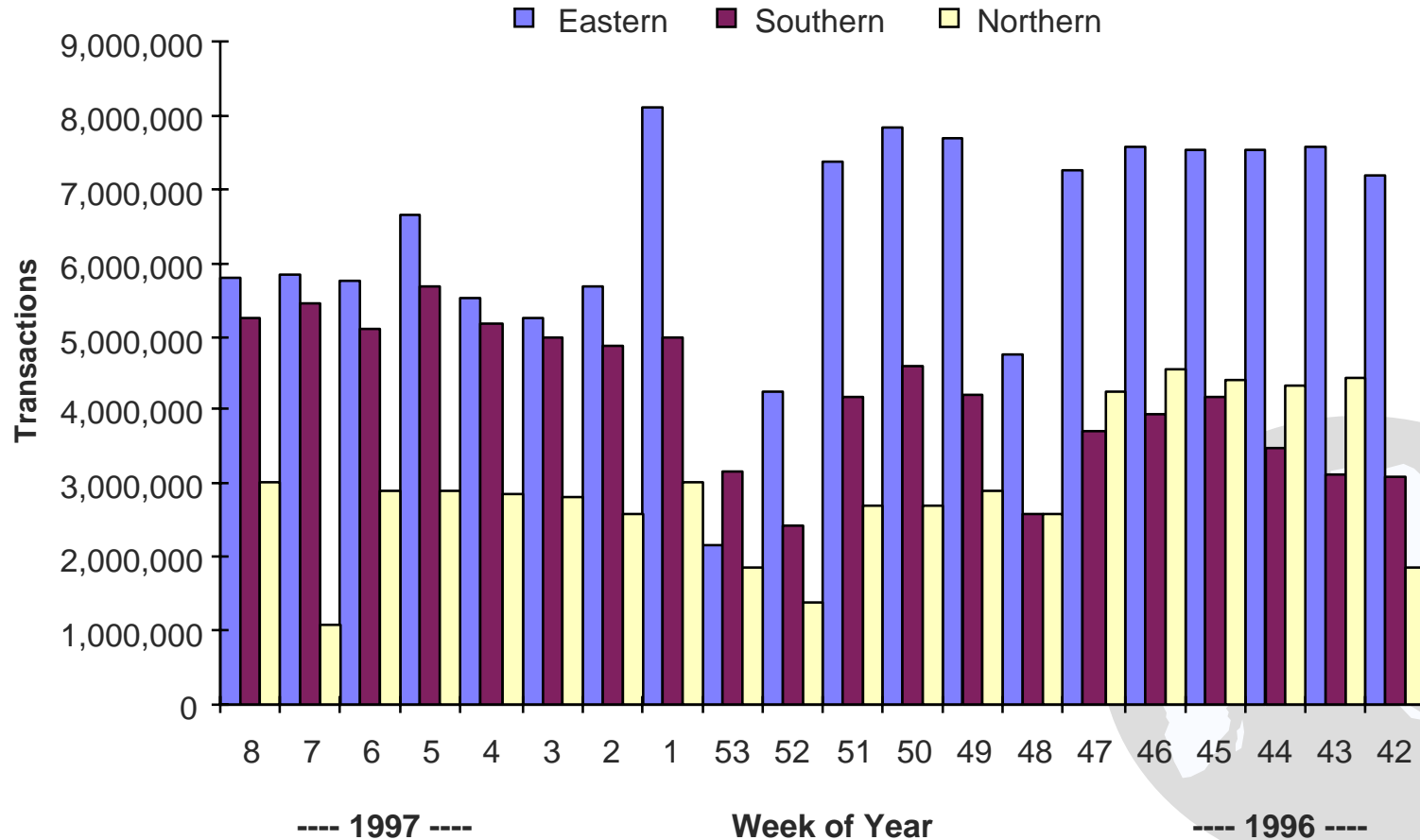
- ◆ **IPCP failures and late batch account for nearly all file availability problems.**
- ◆ **Schedule errors stem from poor holiday scheduling and lack of schedule automation.**
- ◆ **Processing alerts for batch problems is insufficient.**



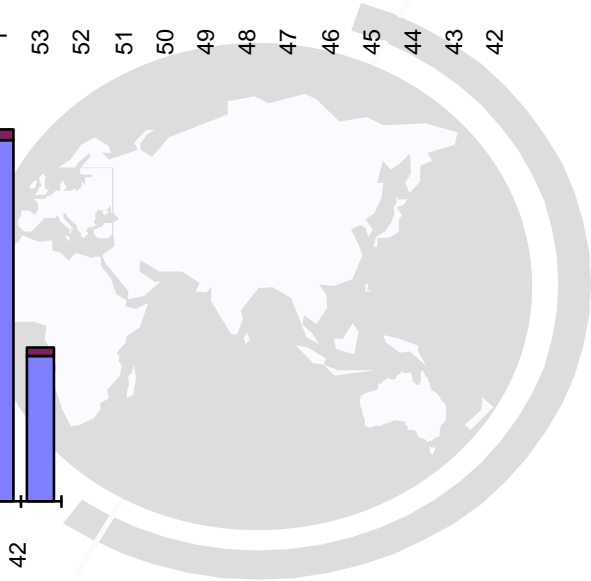
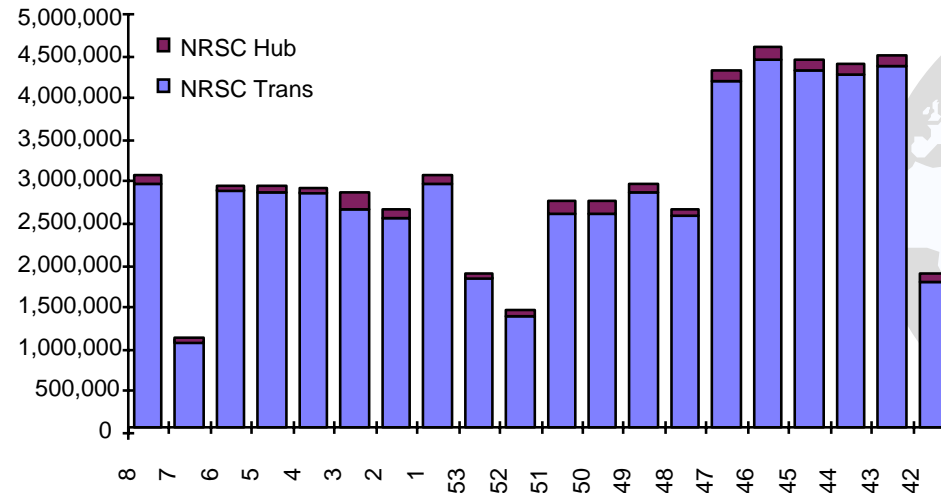
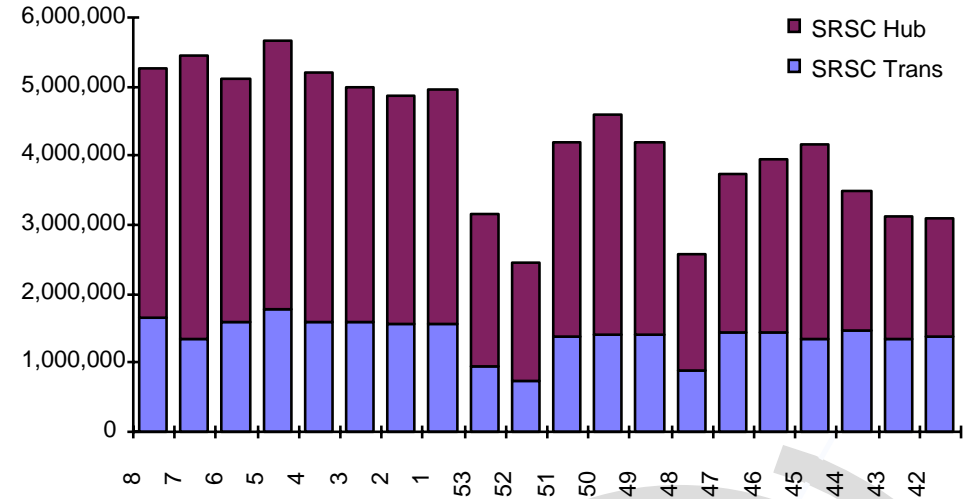
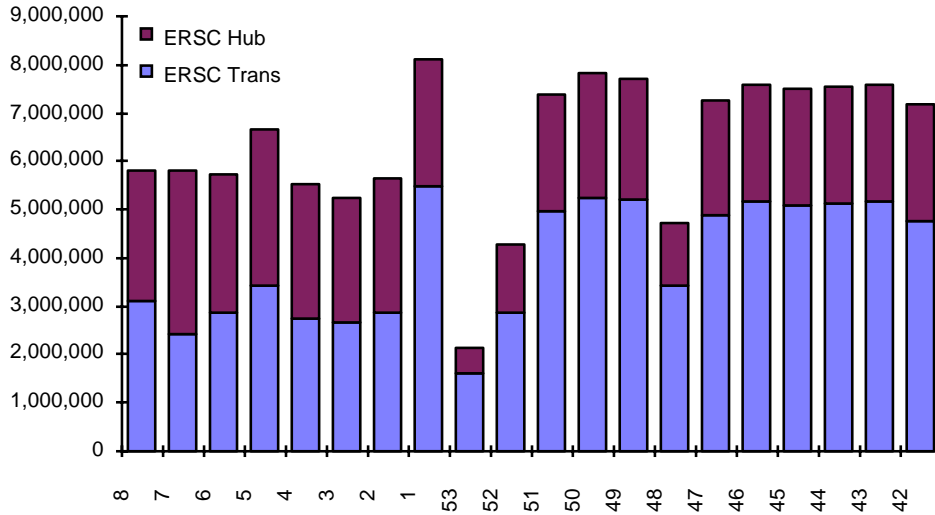
# On-line (CICS) problems by Service Center shows the same general distribution as batch errors.



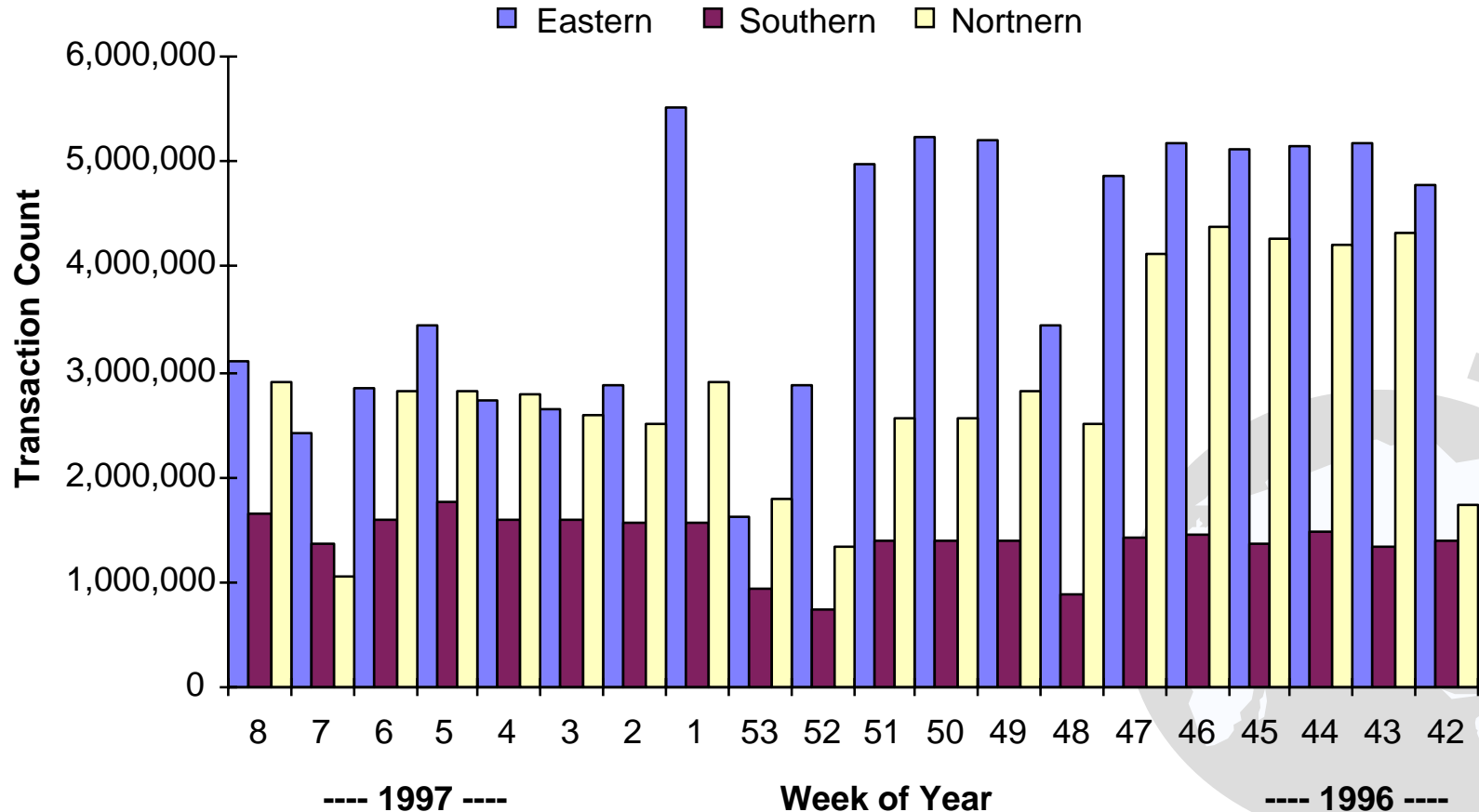
# The fact that the NRSC has the highest CICS problem rate is not rooted in transaction rate.



# Hub Traffic in each SC is not uniform



# Non-Hub transaction rates show actual CSO work performed.



# CSO Problem Analysis Summary

- ◆ **NRSC has the most CICS complexity - thus it is the most unstable in terms of errors reported.**
- ◆ **File availability problems stem from batch errors or delays.**
- ◆ **Application errors stem from inadequate quality control and testing.**
- ◆ **Problem management needs refinement.**



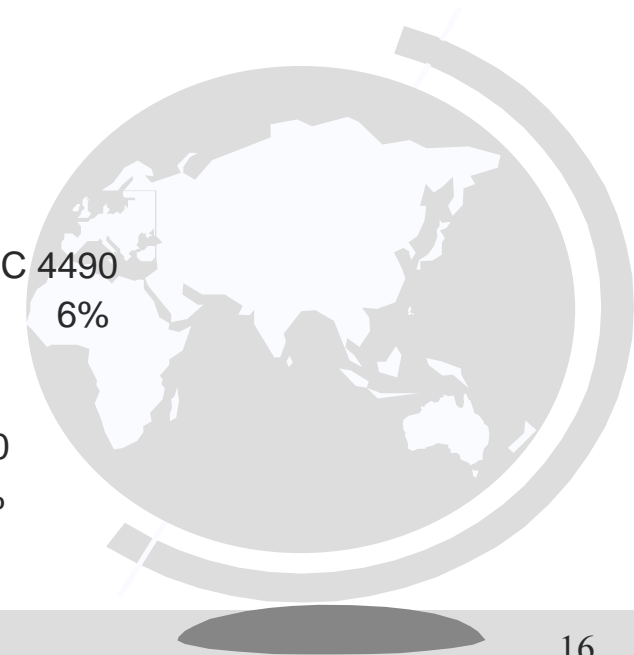
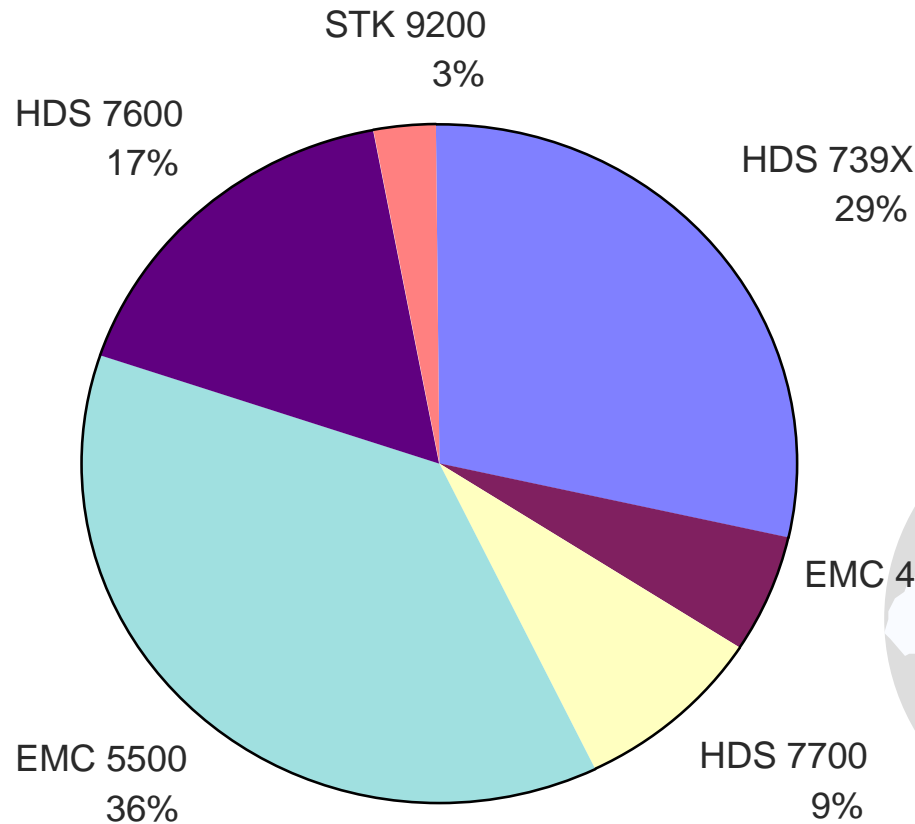
# **System Hardware and Software problem impact on CSO processing was not discernible.**

- ◆ **No Problem management record fields correlated hardware (e.g. DASD) outages with applications affected.**
- ◆ **In comparison to other problems system software problems had nominal impact on CSO.**
- ◆ **A CSC perception was that older DASD was destabilizing.**
- ◆ **We were asked to identify “single points of failure” exposures in the overall SC configurations.**



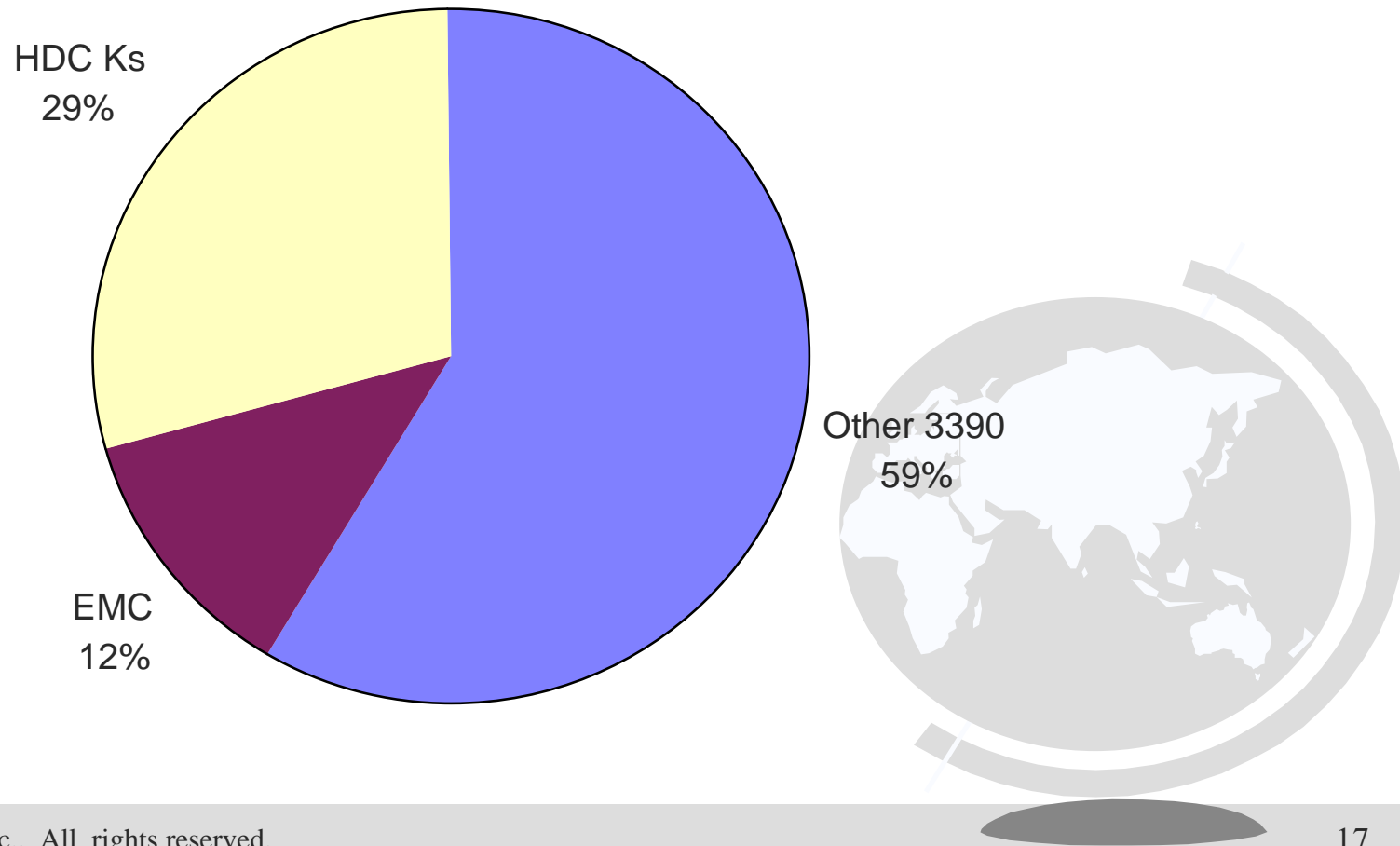
# We used CSC InfoMan DASD error records to analyze DASD failure rates and causes.

CSC DASD Failures - 12/15/96 to 3/14/97



# DASD “K” model population vs. EMC would suggest K units have a better MTF rate.

K Model Population in CSC

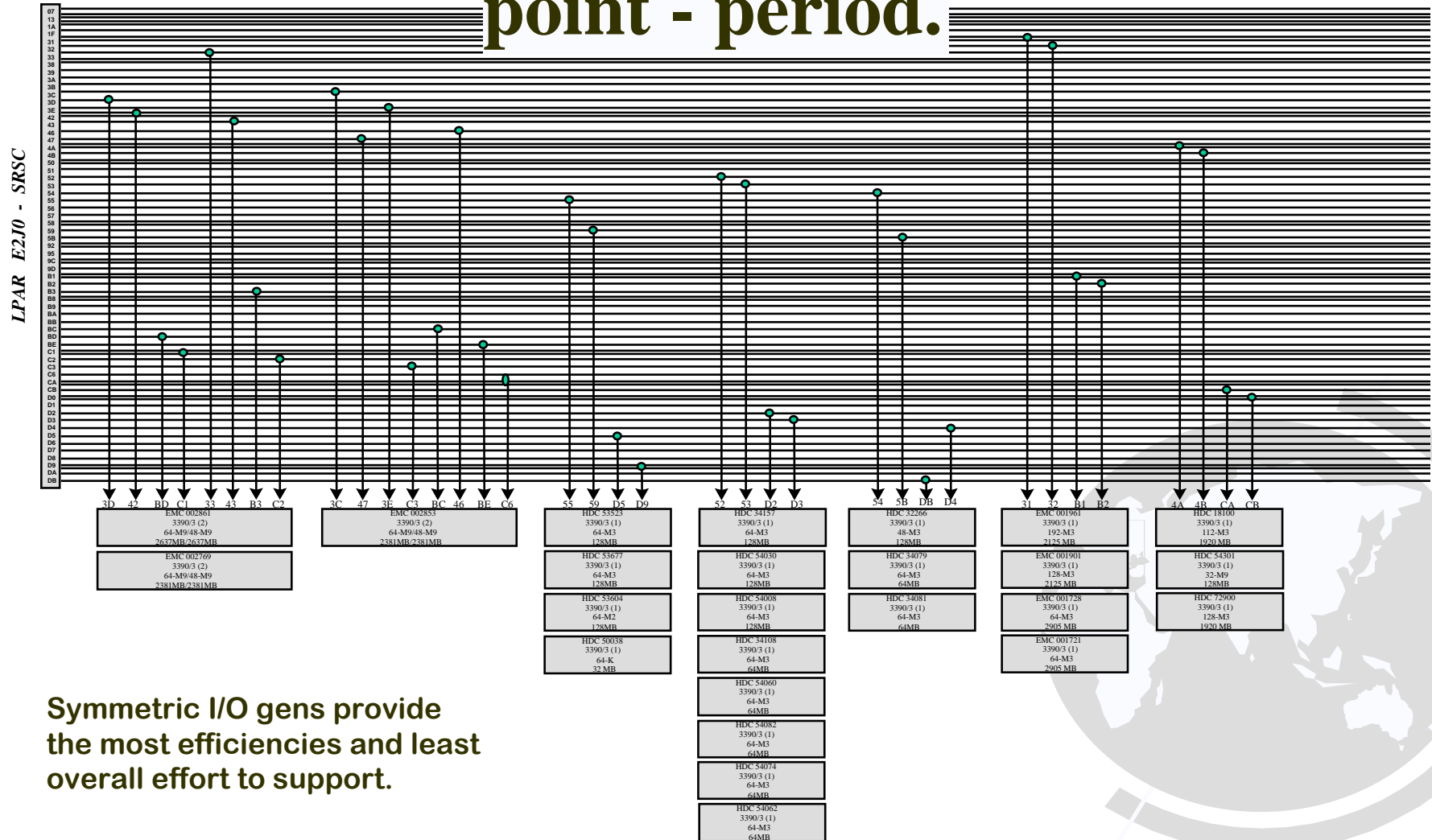


# The statistics vs. the data on DASD failures

- ◆ **K model failures accounted for 100% of lost data due to DASD failure.**
- ◆ **K model failures accounted for 99% of application interruptions (abends, delays,...).**
- ◆ **EMC errors were recovered, without SC interruption or support 95% of the time.**



# Finding a “single point of failure” was complicated by not being able to find a single point - period.



Symmetric I/O gens provide the most efficiencies and least overall effort to support.

# Summary of Recommendations

## *CSO Batch Processing*

- ◆ **A proactive file state monitor is needed.**
- ◆ **Batch schedules require significant enhancement and automation.**
- ◆ **A critical path batch alert monitor would provide significant benefits.**



# Summary of Recommendations

## (Continued)

### *CSO On-line Processing*

- ◆ **CSO Hub regions require redundancy.**
- ◆ **There should be Zero tolerance for CICS storage violations and looping transactions.**
- ◆ **A proactive file state monitor would address 1/3 of all CICS problems.**

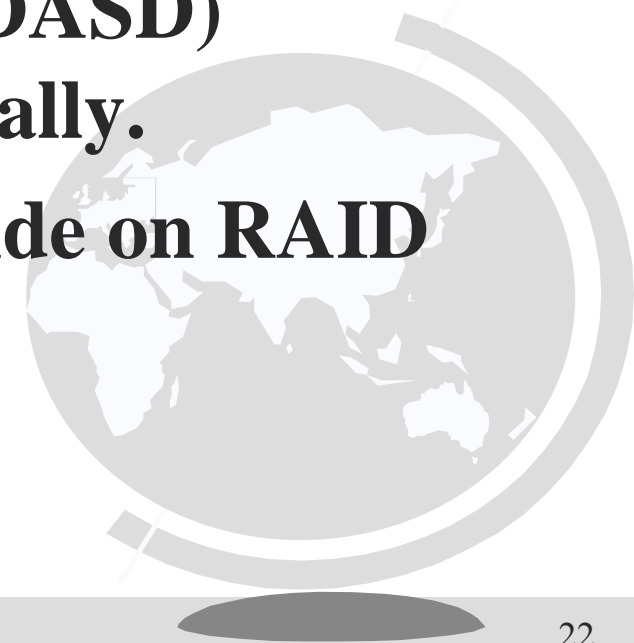


# Summary of Recommendations

## (Continued)

### *PSC Systems Hardware and Software*

- ◆ **CPU reports by CICS Region are suggested.**
- ◆ **Hardware pathing (especially DASD) should be illustrated schematically.**
- ◆ **All production data should reside on RAID DASD.**



# Summary of Recommendations

## (Continued)

### *Problem Management*

- ◆ **All production Abends (except JCL errors) should be automatically logged to InfoMan to insure all errors are reported.**
- ◆ **Add filtering data to InfoMan records (e.g. BU code, impact codes, duration of outage) to facilitate SLA impact analysis.**
- ◆ **More discipline in reporting - assign a “problem owner” to reduce open problems.**