How is the error computed:

Normawise relative backward error (NBRE v1); called *backward error* in the documentation:

$$\text{NBRE} = \max_{i \in \{1 \ldots n\}} \frac{|b - Ax|_i}{(|A||x| + |b|)_i}$$

Scaled residuals (SR):

$$\text{SR} = \frac{\max_{i \in \{1,\ldots,n\}} |\sum_{j=1}^{n} a_{ij} x_j - b_i|}{\|A\|_\infty \|x\|_\infty}$$

Name	av. NBRE	av. SR	Failure rate
TAMU 500			
CPU	$3.24 \cdot 10^{-16}$	$6.13 \cdot 10^{-25}$	0 %
Case 118			
CPU	–	–	100 %
RTS – 1 TP			
CPU	$1.84 \cdot 10^{-16}$	$6.82 \cdot 10^{-19}$	0%
RTS – 2 TP			
CPU	$1.97 \cdot 10^{-16}$	$9.50 \cdot 10^{-19}$	0%
ACTIVSg200			
CPU	$2.03 \cdot 10^{-16}$	$1.05 \cdot 10^{-20}$	0%
ACTIVSg2000			
CPU	$2.78 \cdot 10^{-16}$	$6.64 \cdot 10^{-23}$	0%
ACTIVSg10k			
CPU	$2.71 \cdot 10^{-16}$	$1.17 \cdot 10^{-22}$	0%
ACTIVSg70k			
CPU	$1.50 \cdot 10^{-3}$	$5.20 \cdot 10^{-22}$	0%

Table 1: The error levels achieved in MA57.

All results presented in this document have been computed on one node of Oak Ridge OLCF summit supercomputer. Note: ma57 is a non-threaded, non GPU accelerated code. This set of results has been included for completeness and easy comparison.

ma57 computations can be split three basic phases:

1. Analysis,
2. Factorization,
3. Solve.

All times are given in seconds.

TAMU 500				
Method	Analyse	Factor	Solve	TOTAL
CPU	0.0210	0.1361	0.0185	0.1756

For the Case118 matrices, MA57 fails with *incorrect objective type* error.

Case 118				
Method	Analyse	Factor	Solve	TOTAL
CPU	–	–	–	–

RTS – One Time Period				
Method	Analyse	Factor	Solve	TOTAL
CPU	0.0009	0.0036	0.0008	0.0053

RTS – Two Time Period				
Method	Analyse	Factor	Solve	TOTAL
CPU	0.0016	0.0071	0.0015	0.0102

ACTIVSg200				
Method	Analyse	Factor	Solve	TOTAL
CPU	0.0019	0.0079	0.0019	0.0117

ACTIVSg2000				
Method	Analyse	Factor	Solve	TOTAL
CPU	0.0195	0.1624	0.0316	0.2134

ACTIVSg10k				
Method	Analyse	Factor	Solve	TOTAL
CPU	0.0869	0.3873	0.1256	0.59984

ACTIVSg70k				
Method	Analyse	Factor	Solve	TOTAL
CPU	0.7522	3.9431	0.9238	5.6191

Table 2: MA57 performance on the CPU.