An empirical investigation into the effectiveness of statistical process control techniques, with management data from a product development environment.

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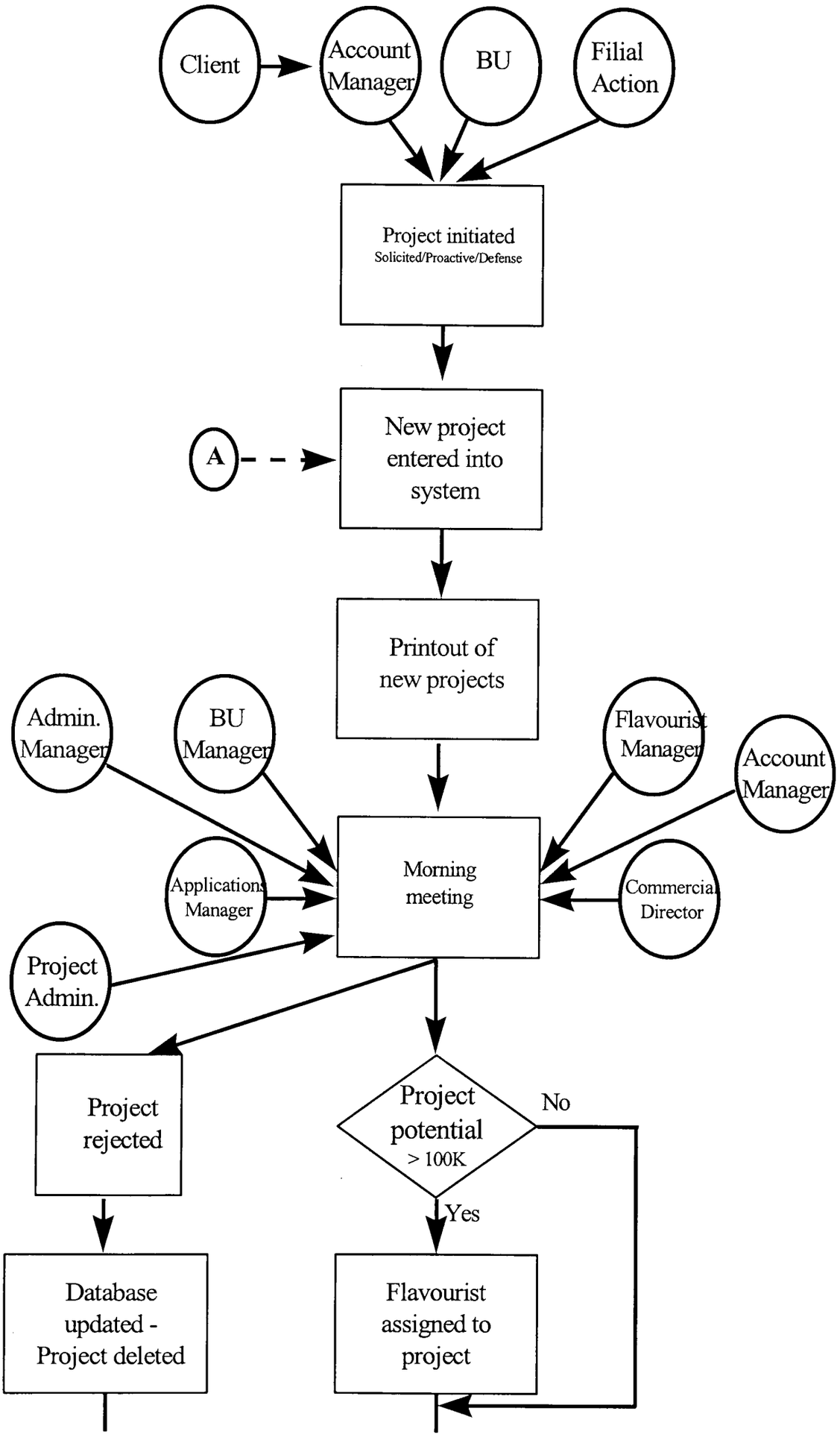
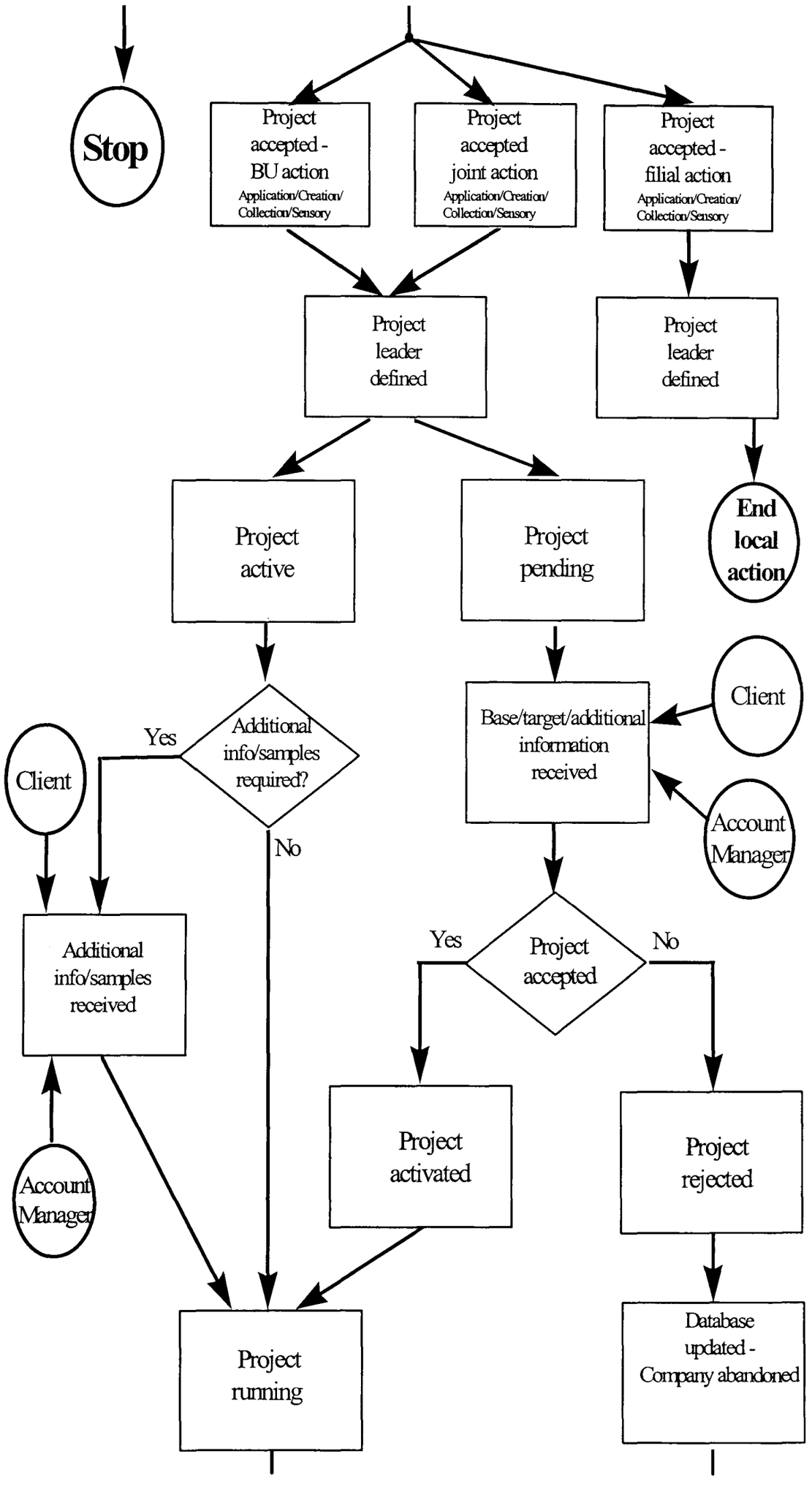
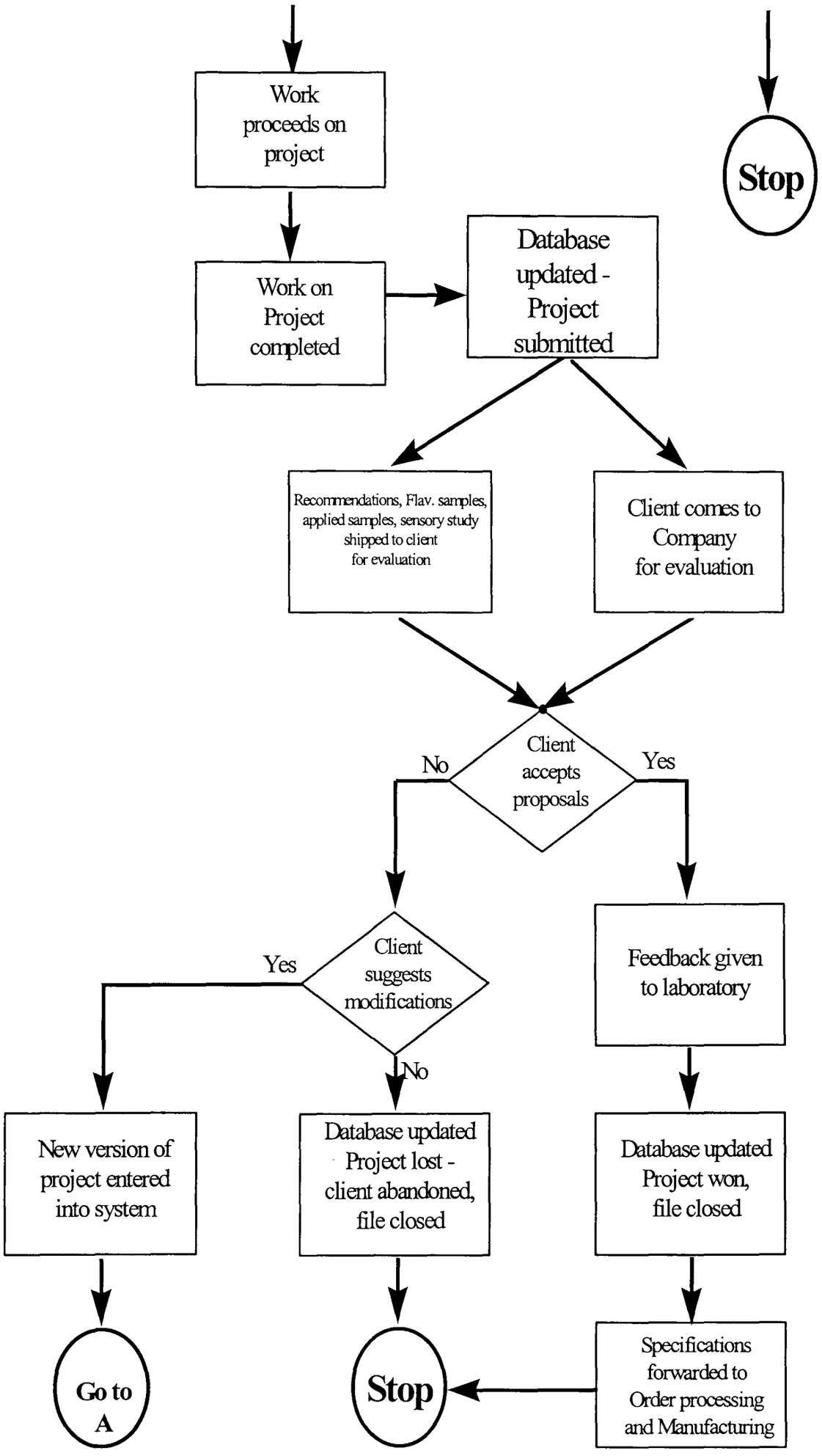
Appendix 1

Product Development Process Flowchart


Client
Account Manager
BU
Filial Action
Project initiated
Solicited/Proactive/Defense
A
New project entered into system
Printout of new projects
Admin. Manager
BU Manager
Flavourist Manager
Account Manager
Application Manager
Morning meeting
Commercial Director
Project Admin.
Project rejected
Project potential
> 100K
No
Yes
Database updated - Project deleted
Flavourist assigned to project


Stop
Project accepted - BU action
Application/Creation/ Collection/Sensory
Project accepted joint action
Application/Creation/ Collection/Sensory
Project accepted - filial action
Application/Creation/ Collection/Sensory
Project leader defined
Project leader defined
Project active
Project pending
End local action
Client
Yes
Additional info/samples required?
No
Base/target/additional information received
Client
Account Manager
Additional info/samples received
Yes
Project accepted
No
Account Manager
Project activated
Project rejected
Project running
Database updated - Company abandoned


Work proceeds on project
Work on Project completed
Database updated - Project submitted
Stop
Recommendations, Flav. samples, applied samples, sensory study shipped to client for evaluation
Client comes to Company for evaluation
Client accepts proposals
No
Yes
Client suggests modifications
Yes
No
Feedback given to laboratory
New version of project entered into system
Database updated Project lost - client abandoned, file closed
Database updated Project won, file closed
Go to A
Stop
Specifications forwarded to Order processing and Manufacturing

Appendix 2

Statview® Algorithms

Mean

$$\bar{x} = \frac{\sum X}{n}$$, where n = count

Variance

$$s^2 = \frac{\sum \left(X - \bar{x} \right)^2}{n-1}$$

Standard deviation

$$s = \sqrt{s^2}$$

Kurtosis and Skewness

$$Kurtosis = \left(m_4 / m_2^2 \right) - 3$$

$$Skewness = m_3 / \left(m_2 \sqrt{m_2} \right)$$, where

$$m_2 = \frac{\sum \left(X - \bar{x} \right)^2}{n}$$

$$m_3 = \frac{\sum \left(X - \bar{x} \right)^3}{n}$$

$$m_4 = \frac{\sum \left(X - \bar{x} \right)^4}{n}$$

Trimmed mean

$$p\%\ Trimmed\ Mean = \left(X_{k+1} + ... + X_{n-k} \right) / n - 2k$$, where the *X*s are sorted from smallest to largest and *k* is chosen so that *k* observations represent *p%* of the data.

T-test

Δ = *hypothesised mean difference, entered by user*

$t = (D - \Delta)/SE$, where

N_1 = *number of observations in group 1,*

N_2 = *number of observations in group 2,*

$DF = N_1 + N_2 - 2$

$\overline{x_1}$ *is the mean of the group 1 observations*

$\overline{x_2}$ *is the mean of the group 2 observations*

$D = \overline{x_1} - \overline{x_2}$

s_1 *is the standard deviation of the group 1 observations*

s_2 *is the standard deviation of the group 2 observations*

Standard error (SE):

$$SE = \sqrt{\frac{s_1^2(N_1 - 1) + s_2^2(N_2 - 1)}{DF} \times \frac{N_1 + N_2}{N_1 N_2}}$$

XmR Control chart formulas

X chart.

The centre line is computed as $cl = \mu$, where μ is the mean of all measurements.

If the control limits are based on *k-sigma*, then

$$UCL = cl + \frac{k\sigma}{\sqrt{n_i}}$$

$$LCL = cl - \frac{k\sigma}{\sqrt{n_i}}$$

If the control limits are based on alpha, then

$$UCL = cl + Z_{\alpha/2}\frac{\sigma}{\sqrt{n_i}}$$

$$LCL = cl - Z_{\alpha/2}\frac{\sigma}{\sqrt{n_i}}$$

MR chart

The centre line is computed as cl = $\overline{MR}$

If the control limits are based on *k-sigma*, then

$$UCL = cl + k\sigma d_3(rs)$$

$$LCL = cl - k\sigma d_3(rs)$$

If the control limits are based on alpha, then

$$UCL = D_{1-\alpha/2}(rs)\sigma$$

$$UCL = D_{\alpha/2}(rs)\sigma$$

Appendix 3

Expondist Description

EXPONDIST FUNCTION[i]

Returns the exponential distribution. Use EXPONDIST to model the time between events, such as how long an automated bank teller takes to deliver cash. For example, you can use EXPONDIST to determine the probability that the process takes at most one minute.

Syntax

EXPONDIST(x, lambda, cumulative)

X is the value of the function.

Lambda is the parameter value.

Cumulative is a logical value that indicates which form of the exponential function to provide. If cumulative is TRUE, EXPONDIST returns the cumulative distribution function; if FALSE, it returns the probability density function.

Remarks

If x or lambda is non-numeric, EXPONDIST returns the #VALUE! error value.

If $x < 0$, EXPONDIST returns the #NUM! error value.

If lambda ≤ 0, EXPONDIST returns the #NUM! error value.

The equation for the probability density function is:

$f(x; \lambda) = \lambda e^{-\lambda x}$

The equation for the cumulative distribution function is:

$F(x; \lambda) = 1 - e^{-\lambda x}$

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[i] Reproduced from Microsoft Excel Online Help.

Appendix 4

Exponential Lookup Table

Mean time	11	12	13	14	15	17
Lambda (1/Mean time)	0.09	0.08	0.08	0.07	0.07	0.06
Limits for Turnround time						
0.02	0.0018	0.0017	0.0015	0.0014	0.0013	0.0012
0.04	0.0036	0.0033	0.0031	0.0029	0.0027	0.0024
0.06	0.0054	0.0050	0.0046	0.0043	0.0040	0.0035
0.08	0.0072	0.0066	0.0061	0.0057	0.0053	0.0047
0.10	0.0090	0.0083	0.0077	0.0071	0.0066	0.0059
0.12	0.0108	0.0100	0.0092	0.0085	0.0080	0.0070
0.14	0.0126	0.0116	0.0107	0.0100	0.0093	0.0082
0.16	0.0144	0.0132	0.0122	0.0114	0.0106	0.0094
0.18	0.0162	0.0149	0.0138	0.0128	0.0119	0.0105
0.20	0.0180	0.0165	0.0153	0.0142	0.0132	0.0117
0.22	0.0198	0.0182	0.0168	0.0156	0.0146	0.0129
0.24	0.0216	0.0198	0.0183	0.0170	0.0159	0.0140
0.26	0.0234	0.0214	0.0198	0.0184	0.0172	0.0152
0.28	0.0251	0.0231	0.0213	0.0198	0.0185	0.0163
0.30	0.0269	0.0247	0.0228	0.0212	0.0198	0.0175
0.32	0.0287	0.0263	0.0243	0.0226	0.0211	0.0186
0.34	0.0304	0.0279	0.0258	0.0240	0.0224	0.0198
0.36	0.0322	0.0296	0.0273	0.0254	0.0237	0.0210
0.38	0.0340	0.0312	0.0288	0.0268	0.0250	0.0221
0.40	0.0357	0.0328	0.0303	0.0282	0.0263	0.0233
0.42	0.0375	0.0344	0.0318	0.0296	0.0276	0.0244
0.44	0.0392	0.0360	0.0333	0.0309	0.0289	0.0256
0.58	0.0514	0.0472	0.0436	0.0406	0.0379	0.0335
51	0.9903	0.9857	0.9802	0.9738	0.9666	0.9502
56	0.9938	0.9906	0.9865	0.9817	0.9761	0.9629
60	0.9957	0.9933	0.9901	0.9862	0.9817	0.9707
65	0.9973	0.9956	0.9933	0.9904	0.9869	0.9781
69	0.9981	0.9968	0.9950	0.9928	0.9899	0.9827
70	0.9983	0.9971	0.9954	0.9933	0.9906	0.9837
75	0.9989	0.9981	0.9969	0.9953	0.9933	0.9879
76	0.9990	0.9982	0.9971	0.9956	0.9937	0.9886
79	0.9992	0.9986	0.9977	0.9965	0.9948	0.9904
81	0.9994	0.9988	0.9980	0.9969	0.9955	0.9915
83	0.9995	0.9990	0.9983	0.9973	0.9960	0.9924
87	0.9996	0.9993	0.9988	0.9980	0.9970	0.9940
88	0.9997	0.9993	0.9989	0.9981	0.9972	0.9944
90	0.9997	0.9994	0.9990	0.9984	0.9975	0.9950
93	0.9998	0.9996	0.9992	0.9987	0.9980	0.9958
97	0.9999	0.9997	0.9994	0.9990	0.9984	0.9967
102	0.9999	0.9998	0.9996	0.9993	0.9989	0.9975
104	0.9999	0.9998	0.9997	0.9994	0.9990	0.9978
106	0.9999	0.9999	0.9997	0.9995	0.9991	0.9980
111	1.0000	0.9999	0.9998	0.9996	0.9994	0.9985
112	1.0000	0.9999	0.9998	0.9997	0.9994	0.9986
116	1.0000	0.9999	0.9999	0.9997	0.9996	0.9989
118	1.0000	0.9999	0.9999	0.9998	0.9996	0.9990
120	1.0000	1.0000	0.9999	0.9998	0.9997	0.9991
124	1.0000	1.0000	0.9999	0.9999	0.9997	0.9993
125	1.0000	1.0000	0.9999	0.9999	0.9998	0.9994
129	1.0000	1.0000	1.0000	0.9999	0.9998	0.9995
131	1.0000	1.0000	1.0000	0.9999	0.9998	0.9995
132	1.0000	1.0000	1.0000	0.9999	0.9998	0.9996

Mean time	11	12	13	14	15	17
Lambda (1/Mean time)	0.09	0.08	0.08	0.07	0.07	0.06
Limits for Turnround time						
134	1.0000	1.0000	1.0000	0.9999	0.9999	0.9996
137	1.0000	1.0000	1.0000	0.9999	0.9999	0.9997
139	1.0000	1.0000	1.0000	1.0000	0.9999	0.9997
143	1.0000	1.0000	1.0000	1.0000	0.9999	0.9998
146	1.0000	1.0000	1.0000	1.0000	0.9999	0.9998
148	1.0000	1.0000	1.0000	1.0000	0.9999	0.9998
149	1.0000	1.0000	1.0000	1.0000	1.0000	0.9998
152	1.0000	1.0000	1.0000	1.0000	1.0000	0.9999
155	1.0000	1.0000	1.0000	1.0000	1.0000	0.9999
157	1.0000	1.0000	1.0000	1.0000	1.0000	0.9999
159	1.0000	1.0000	1.0000	1.0000	1.0000	0.9999
162	1.0000	1.0000	1.0000	1.0000	1.0000	0.9999
166	1.0000	1.0000	1.0000	1.0000	1.0000	0.9999
168	1.0000	1.0000	1.0000	1.0000	1.0000	0.9999
171	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
173	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
174	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
175	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
180	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
185	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
187	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
189	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
193	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
194	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
199	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
201	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
203	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
205	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
208	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
212	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
215	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
218	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
222	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
224	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
228	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
230	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
235	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
237	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
242	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
243	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
249	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
255	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
256	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
262	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
263	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
268	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
270	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
274	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
277	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
284	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
291	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
298	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

Mean time	11	12	13	14	15	17
Lambda (1/Mean time)	0.09	0.08	0.08	0.07	0.07	0.06
Limits for Turnround time						
304	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
355	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
394	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

Mean time	18	19	20	21	22	23
Lambda (1/Mean time)	0.06	0.05	0.05	0.05	0.05	0.04
Limits for Turnround time						
0.02	0.0011	0.0011	0.0010	0.0010	0.0009	0.0009
0.04	0.0022	0.0021	0.0020	0.0019	0.0018	0.0017
0.06	0.0033	0.0032	0.0030	0.0029	0.0027	0.0026
0.08	0.0044	0.0042	0.0040	0.0038	0.0036	0.0035
0.10	0.0055	0.0052	0.0050	0.0048	0.0045	0.0043
0.12	0.0066	0.0063	0.0060	0.0057	0.0054	0.0052
0.14	0.0077	0.0073	0.0070	0.0066	0.0063	0.0061
0.16	0.0088	0.0084	0.0080	0.0076	0.0072	0.0069
0.18	0.0100	0.0094	0.0090	0.0085	0.0081	0.0078
0.20	0.0110	0.0105	0.0100	0.0095	0.0090	0.0087
0.22	0.0121	0.0115	0.0109	0.0104	0.0100	0.0095
0.24	0.0132	0.0126	0.0119	0.0114	0.0108	0.0104
0.26	0.0143	0.0136	0.0129	0.0123	0.0117	0.0112
0.28	0.0154	0.0146	0.0139	0.0132	0.0126	0.0121
0.30	0.0165	0.0157	0.0149	0.0142	0.0135	0.0130
0.32	0.0176	0.0167	0.0159	0.0151	0.0144	0.0138
0.34	0.0187	0.0177	0.0169	0.0161	0.0153	0.0147
0.36	0.0198	0.0188	0.0178	0.0170	0.0162	0.0155
0.38	0.0209	0.0198	0.0188	0.0179	0.0171	0.0164
0.40	0.0220	0.0208	0.0198	0.0189	0.0180	0.0172
0.42	0.0231	0.0219	0.0208	0.0198	0.0189	0.0181
0.44	0.0241	0.0229	0.0218	0.0207	0.0198	0.0189
0.58	0.0317	0.0301	0.0286	0.0272	0.0260	0.0249
51	0.9412	0.9317	0.9219	0.9118	0.9015	0.8911
56	0.9554	0.9475	0.9392	0.9305	0.9216	0.9124
60	0.9643	0.9575	0.9502	0.9426	0.9346	0.9264
65	0.9730	0.9673	0.9612	0.9547	0.9479	0.9408
69	0.9784	0.9735	0.9683	0.9626	0.9566	0.9502
70	0.9795	0.9749	0.9698	0.9643	0.9585	0.9523
75	0.9845	0.9807	0.9765	0.9719	0.9669	0.9616
76	0.9853	0.9817	0.9776	0.9732	0.9684	0.9633
79	0.9876	0.9844	0.9807	0.9768	0.9724	0.9678
81	0.9889	0.9859	0.9826	0.9789	0.9748	0.9705
83	0.9901	0.9873	0.9842	0.9808	0.9770	0.9729
87	0.9920	0.9897	0.9871	0.9841	0.9808	0.9772
88	0.9925	0.9903	0.9877	0.9849	0.9817	0.9782
90	0.9933	0.9912	0.9889	0.9862	0.9833	0.9800
93	0.9943	0.9925	0.9904	0.9881	0.9854	0.9825
97	0.9954	0.9939	0.9922	0.9901	0.9878	0.9853
102	0.9965	0.9953	0.9939	0.9922	0.9903	0.9881
104	0.9969	0.9958	0.9945	0.9929	0.9911	0.9891
106	0.9972	0.9962	0.9950	0.9936	0.9919	0.9900
111	0.9979	0.9971	0.9961	0.9949	0.9936	0.9920
112	0.9980	0.9972	0.9963	0.9952	0.9938	0.9923
116	0.9984	0.9978	0.9970	0.9960	0.9949	0.9935
118	0.9986	0.9980	0.9973	0.9964	0.9953	0.9941
120	0.9987	0.9982	0.9975	0.9967	0.9957	0.9946
124	0.9990	0.9985	0.9980	0.9973	0.9964	0.9954
125	0.9990	0.9986	0.9981	0.9974	0.9966	0.9956
129	0.9992	0.9989	0.9984	0.9979	0.9972	0.9963
131	0.9993	0.9990	0.9986	0.9980	0.9974	0.9966
132	0.9993	0.9990	0.9986	0.9981	0.9975	0.9968

Mean time	18	19	20	21	22	23
Lambda (1/Mean time)	0.06	0.05	0.05	0.05	0.05	0.04
Limits for Turnround time						
134	0.9994	0.9991	0.9988	0.9983	0.9977	0.9971
137	0.9995	0.9993	0.9989	0.9985	0.9980	0.9974
139	0.9996	0.9993	0.9990	0.9987	0.9982	0.9976
143	0.9996	0.9995	0.9992	0.9989	0.9985	0.9980
146	0.9997	0.9995	0.9993	0.9990	0.9987	0.9982
148	0.9997	0.9996	0.9994	0.9991	0.9988	0.9984
149	0.9997	0.9996	0.9994	0.9992	0.9989	0.9985
152	0.9998	0.9997	0.9995	0.9993	0.9990	0.9987
155	0.9998	0.9997	0.9996	0.9994	0.9991	0.9988
157	0.9998	0.9997	0.9996	0.9994	0.9992	0.9989
159	0.9999	0.9998	0.9996	0.9995	0.9993	0.9990
162	0.9999	0.9998	0.9997	0.9996	0.9994	0.9991
166	0.9999	0.9998	0.9998	0.9996	0.9995	0.9993
168	0.9999	0.9999	0.9998	0.9997	0.9995	0.9993
171	0.9999	0.9999	0.9998	0.9997	0.9996	0.9994
173	0.9999	0.9999	0.9998	0.9997	0.9996	0.9995
174	0.9999	0.9999	0.9998	0.9997	0.9996	0.9995
175	0.9999	0.9999	0.9998	0.9998	0.9996	0.9995
180	1.0000	0.9999	0.9999	0.9998	0.9997	0.9996
185	1.0000	0.9999	0.9999	0.9999	0.9998	0.9997
187	1.0000	0.9999	0.9999	0.9999	0.9998	0.9997
189	1.0000	1.0000	0.9999	0.9999	0.9998	0.9997
193	1.0000	1.0000	0.9999	0.9999	0.9998	0.9998
194	1.0000	1.0000	0.9999	0.9999	0.9999	0.9998
199	1.0000	1.0000	1.0000	0.9999	0.9999	0.9998
201	1.0000	1.0000	1.0000	0.9999	0.9999	0.9998
203	1.0000	1.0000	1.0000	0.9999	0.9999	0.9999
205	1.0000	1.0000	1.0000	0.9999	0.9999	0.9999
208	1.0000	1.0000	1.0000	1.0000	0.9999	0.9999
212	1.0000	1.0000	1.0000	1.0000	0.9999	0.9999
215	1.0000	1.0000	1.0000	1.0000	0.9999	0.9999
218	1.0000	1.0000	1.0000	1.0000	1.0000	0.9999
222	1.0000	1.0000	1.0000	1.0000	1.0000	0.9999
224	1.0000	1.0000	1.0000	1.0000	1.0000	0.9999
228	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
230	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
235	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
237	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
242	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
243	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
249	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
255	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
256	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
262	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
263	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
268	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
270	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
274	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
277	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
284	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
291	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
298	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

Mean time	18	19	20	21	22	23
Lambda (1/Mean time)	0.06	0.05	0.05	0.05	0.05	0.04
Limits for Turnround time						
304	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
355	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
394	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

Mean time	24	25	26	27	28	29
Lambda (1/Mean time)	0.04	0.04	0.04	0.04	0.04	0.03
Limits for Turnround time						
0.02	0.0008	0.0008	0.0008	0.0007	0.0007	0.0007
0.04	0.0017	0.0016	0.0015	0.0015	0.0014	0.0014
0.06	0.0025	0.0024	0.0023	0.0022	0.0021	0.0021
0.08	0.0033	0.0032	0.0031	0.0030	0.0029	0.0028
0.10	0.0042	0.0040	0.0038	0.0037	0.0036	0.0034
0.12	0.0050	0.0048	0.0046	0.0044	0.0043	0.0041
0.14	0.0058	0.0056	0.0054	0.0052	0.0050	0.0048
0.16	0.0066	0.0064	0.0061	0.0059	0.0057	0.0055
0.18	0.0075	0.0072	0.0069	0.0066	0.0064	0.0062
0.20	0.0083	0.0080	0.0077	0.0074	0.0071	0.0069
0.22	0.0091	0.0088	0.0084	0.0081	0.0078	0.0076
0.24	0.0100	0.0096	0.0092	0.0088	0.0085	0.0082
0.26	0.0108	0.0103	0.0100	0.0096	0.0092	0.0089
0.28	0.0116	0.0111	0.0107	0.0103	0.0100	0.0096
0.30	0.0124	0.0119	0.0115	0.0110	0.0107	0.0103
0.32	0.0132	0.0127	0.0122	0.0118	0.0114	0.0110
0.34	0.0141	0.0135	0.0130	0.0125	0.0121	0.0117
0.36	0.0149	0.0143	0.0138	0.0132	0.0128	0.0123
0.38	0.0157	0.0151	0.0145	0.0140	0.0135	0.0130
0.40	0.0165	0.0159	0.0153	0.0147	0.0142	0.0137
0.42	0.0173	0.0167	0.0160	0.0154	0.0149	0.0144
0.44	0.0182	0.0174	0.0168	0.0162	0.0156	0.0151
0.58	0.0239	0.0229	0.0221	0.0213	0.0205	0.0198
51	0.8806	0.8700	0.8594	0.8488	0.8382	0.8277
56	0.9030	0.8935	0.8840	0.8743	0.8647	0.8550
60	0.9179	0.9093	0.9005	0.8916	0.8827	0.8737
65	0.9334	0.9257	0.9179	0.9100	0.9019	0.8937
69	0.9436	0.9367	0.9296	0.9224	0.9149	0.9074
70	0.9459	0.9392	0.9323	0.9252	0.9179	0.9105
75	0.9561	0.9502	0.9441	0.9378	0.9313	0.9247
76	0.9579	0.9522	0.9462	0.9401	0.9337	0.9272
79	0.9628	0.9576	0.9521	0.9464	0.9405	0.9344
81	0.9658	0.9608	0.9556	0.9502	0.9446	0.9388
83	0.9685	0.9638	0.9589	0.9538	0.9484	0.9428
87	0.9734	0.9692	0.9648	0.9601	0.9553	0.9502
88	0.9744	0.9704	0.9661	0.9616	0.9568	0.9519
90	0.9765	0.9727	0.9686	0.9643	0.9598	0.9551
93	0.9792	0.9758	0.9720	0.9681	0.9639	0.9595
97	0.9824	0.9793	0.9760	0.9725	0.9687	0.9647
102	0.9857	0.9831	0.9802	0.9771	0.9738	0.9703
104	0.9869	0.9844	0.9817	0.9788	0.9756	0.9723
106	0.9879	0.9856	0.9830	0.9803	0.9773	0.9741
111	0.9902	0.9882	0.9860	0.9836	0.9810	0.9782
112	0.9906	0.9887	0.9865	0.9842	0.9817	0.9790
116	0.9920	0.9903	0.9885	0.9864	0.9841	0.9817
118	0.9927	0.9911	0.9893	0.9874	0.9852	0.9829
120	0.9933	0.9918	0.9901	0.9883	0.9862	0.9840
124	0.9943	0.9930	0.9915	0.9899	0.9881	0.9861
125	0.9945	0.9933	0.9918	0.9902	0.9885	0.9866
129	0.9954	0.9943	0.9930	0.9916	0.9900	0.9883
131	0.9957	0.9947	0.9935	0.9922	0.9907	0.9891
132	0.9959	0.9949	0.9938	0.9925	0.9910	0.9895

Mean time	24	25	26	27	28	29
Lambda (1/Mean time)	0.04	0.04	0.04	0.04	0.04	0.03
Limits for Turnround time						
134	0.9962	0.9953	0.9942	0.9930	0.9917	0.9902
137	0.9967	0.9958	0.9949	0.9937	0.9925	0.9911
139	0.9969	0.9962	0.9952	0.9942	0.9930	0.9917
143	0.9974	0.9967	0.9959	0.9950	0.9939	0.9928
146	0.9977	0.9971	0.9964	0.9955	0.9946	0.9935
148	0.9979	0.9973	0.9966	0.9958	0.9949	0.9939
149	0.9980	0.9974	0.9968	0.9960	0.9951	0.9941
152	0.9982	0.9977	0.9971	0.9964	0.9956	0.9947
155	0.9984	0.9980	0.9974	0.9968	0.9961	0.9952
157	0.9986	0.9981	0.9976	0.9970	0.9963	0.9955
159	0.9987	0.9983	0.9978	0.9972	0.9966	0.9958
162	0.9988	0.9985	0.9980	0.9975	0.9969	0.9963
166	0.9990	0.9987	0.9983	0.9979	0.9973	0.9967
168	0.9991	0.9988	0.9984	0.9980	0.9975	0.9970
171	0.9992	0.9989	0.9986	0.9982	0.9978	0.9973
173	0.9993	0.9990	0.9987	0.9984	0.9979	0.9974
174	0.9993	0.9991	0.9988	0.9984	0.9980	0.9975
175	0.9993	0.9991	0.9988	0.9985	0.9981	0.9976
180	0.9994	0.9993	0.9990	0.9987	0.9984	0.9980
185	0.9996	0.9994	0.9992	0.9989	0.9986	0.9983
187	0.9996	0.9994	0.9992	0.9990	0.9987	0.9984
189	0.9996	0.9995	0.9993	0.9991	0.9988	0.9985
193	0.9997	0.9996	0.9994	0.9992	0.9990	0.9987
194	0.9997	0.9996	0.9994	0.9992	0.9990	0.9988
199	0.9997	0.9997	0.9995	0.9994	0.9992	0.9990
201	0.9998	0.9997	0.9996	0.9994	0.9992	0.9990
203	0.9998	0.9997	0.9996	0.9995	0.9993	0.9991
205	0.9998	0.9997	0.9996	0.9995	0.9993	0.9991
208	0.9998	0.9998	0.9997	0.9995	0.9994	0.9992
212	0.9999	0.9998	0.9997	0.9996	0.9995	0.9993
215	0.9999	0.9998	0.9997	0.9997	0.9995	0.9994
218	0.9999	0.9998	0.9998	0.9997	0.9996	0.9995
222	0.9999	0.9999	0.9998	0.9997	0.9996	0.9995
224	0.9999	0.9999	0.9998	0.9998	0.9997	0.9996
228	0.9999	0.9999	0.9998	0.9998	0.9997	0.9996
230	0.9999	0.9999	0.9999	0.9998	0.9997	0.9996
235	0.9999	0.9999	0.9999	0.9998	0.9998	0.9997
237	0.9999	0.9999	0.9999	0.9998	0.9998	0.9997
242	1.0000	0.9999	0.9999	0.9999	0.9998	0.9998
243	1.0000	0.9999	0.9999	0.9999	0.9998	0.9998
249	1.0000	1.0000	0.9999	0.9999	0.9999	0.9998
255	1.0000	1.0000	0.9999	0.9999	0.9999	0.9998
256	1.0000	1.0000	0.9999	0.9999	0.9999	0.9999
262	1.0000	1.0000	1.0000	0.9999	0.9999	0.9999
263	1.0000	1.0000	1.0000	0.9999	0.9999	0.9999
268	1.0000	1.0000	1.0000	1.0000	0.9999	0.9999
270	1.0000	1.0000	1.0000	1.0000	0.9999	0.9999
274	1.0000	1.0000	1.0000	1.0000	0.9999	0.9999
277	1.0000	1.0000	1.0000	1.0000	0.9999	0.9999
284	1.0000	1.0000	1.0000	1.0000	1.0000	0.9999
291	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
298	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

Mean time	24	25	26	27	28	29
Lambda (1/Mean time)	0.04	0.04	0.04	0.04	0.04	0.03
Limits for Turnround time						
304	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
355	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
394	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

Mean time	30	31	32	33	34	35
Lambda (1/Mean time)	0.03	0.03	0.03	0.03	0.03	0.03
Limits for Turnround time						
0.02	0.0007	0.0006	0.0006	0.0006	0.0006	0.0006
0.04	0.0013	0.0013	0.0012	0.0012	0.0012	0.0011
0.06	0.0020	0.0019	0.0019	0.0018	0.0018	0.0017
0.08	0.0027	0.0026	0.0025	0.0024	0.0024	0.0023
0.10	0.0033	0.0032	0.0031	0.0030	0.0029	0.0029
0.12	0.0040	0.0039	0.0037	0.0036	0.0035	0.0034
0.14	0.0047	0.0045	0.0044	0.0042	0.0041	0.0040
0.16	0.0053	0.0051	0.0050	0.0048	0.0047	0.0046
0.18	0.0060	0.0058	0.0056	0.0054	0.0053	0.0051
0.20	0.0066	0.0064	0.0062	0.0060	0.0059	0.0057
0.22	0.0073	0.0071	0.0069	0.0066	0.0064	0.0063
0.24	0.0080	0.0077	0.0075	0.0072	0.0070	0.0068
0.26	0.0086	0.0084	0.0081	0.0078	0.0076	0.0074
0.28	0.0093	0.0090	0.0087	0.0084	0.0082	0.0080
0.30	0.0100	0.0096	0.0093	0.0090	0.0088	0.0085
0.32	0.0106	0.0103	0.0100	0.0097	0.0094	0.0091
0.34	0.0113	0.0109	0.0106	0.0103	0.0100	0.0097
0.36	0.0119	0.0115	0.0112	0.0108	0.0105	0.0102
0.38	0.0126	0.0122	0.0118	0.0114	0.0111	0.0108
0.40	0.0132	0.0128	0.0124	0.0120	0.0117	0.0114
0.42	0.0139	0.0135	0.0130	0.0126	0.0123	0.0119
0.44	0.0146	0.0141	0.0137	0.0132	0.0129	0.0125
0.58	0.0191	0.0185	0.0180	0.0174	0.0169	0.0164
51	0.8173	0.8070	0.7968	0.7868	0.7769	0.7671
56	0.8454	0.8358	0.8262	0.8168	0.8074	0.7981
60	0.8647	0.8556	0.8466	0.8377	0.8288	0.8199
65	0.8854	0.8771	0.8688	0.8605	0.8522	0.8439
69	0.8997	0.8920	0.8842	0.8764	0.8686	0.8607
70	0.9030	0.8954	0.8878	0.8801	0.8724	0.8647
75	0.9179	0.9110	0.9040	0.8970	0.8898	0.8827
76	0.9206	0.9138	0.9070	0.9000	0.8930	0.8860
79	0.9282	0.9218	0.9153	0.9087	0.9021	0.8954
81	0.9328	0.9267	0.9204	0.9141	0.9077	0.9012
83	0.9371	0.9313	0.9253	0.9191	0.9129	0.9067
87	0.9450	0.9396	0.9340	0.9284	0.9226	0.9167
88	0.9468	0.9415	0.9361	0.9305	0.9248	0.9191
90	0.9502	0.9452	0.9399	0.9346	0.9291	0.9236
93	0.9550	0.9502	0.9453	0.9403	0.9351	0.9299
97	0.9606	0.9562	0.9517	0.9471	0.9423	0.9374
102	0.9666	0.9628	0.9587	0.9545	0.9502	0.9458
104	0.9688	0.9651	0.9612	0.9572	0.9531	0.9488
106	0.9708	0.9673	0.9636	0.9597	0.9557	0.9516
111	0.9753	0.9721	0.9688	0.9654	0.9618	0.9581
112	0.9761	0.9730	0.9698	0.9664	0.9629	0.9592
116	0.9791	0.9763	0.9734	0.9703	0.9670	0.9636
118	0.9804	0.9778	0.9750	0.9720	0.9689	0.9657
120	0.9817	0.9792	0.9765	0.9737	0.9707	0.9676
124	0.9840	0.9817	0.9792	0.9767	0.9739	0.9711
125	0.9845	0.9823	0.9799	0.9774	0.9747	0.9719
129	0.9864	0.9844	0.9822	0.9799	0.9775	0.9749
131	0.9873	0.9854	0.9833	0.9811	0.9788	0.9763
132	0.9877	0.9859	0.9838	0.9817	0.9794	0.9770

Mean time	30	31	32	33	34	35
Lambda (1/Mean time)	0.03	0.03	0.03	0.03	0.03	0.03
Limits for Turnround time						
134	0.9885	0.9867	0.9848	0.9828	0.9806	0.9783
137	0.9896	0.9880	0.9862	0.9843	0.9822	0.9800
139	0.9903	0.9887	0.9870	0.9852	0.9832	0.9812
143	0.9915	0.9901	0.9885	0.9869	0.9851	0.9832
146	0.9923	0.9910	0.9896	0.9880	0.9864	0.9846
148	0.9928	0.9916	0.9902	0.9887	0.9871	0.9854
149	0.9930	0.9918	0.9905	0.9891	0.9875	0.9858
152	0.9937	0.9926	0.9913	0.9900	0.9886	0.9870
155	0.9943	0.9933	0.9921	0.9909	0.9895	0.9881
157	0.9947	0.9937	0.9926	0.9914	0.9901	0.9887
159	0.9950	0.9941	0.9930	0.9919	0.9907	0.9894
162	0.9955	0.9946	0.9937	0.9926	0.9915	0.9902
166	0.9960	0.9953	0.9944	0.9935	0.9924	0.9913
168	0.9963	0.9956	0.9948	0.9938	0.9929	0.9918
171	0.9967	0.9960	0.9952	0.9944	0.9935	0.9924
173	0.9969	0.9962	0.9955	0.9947	0.9938	0.9929
174	0.9970	0.9963	0.9956	0.9949	0.9940	0.9931
175	0.9971	0.9965	0.9958	0.9950	0.9942	0.9933
180	0.9975	0.9970	0.9964	0.9957	0.9950	0.9942
185	0.9979	0.9974	0.9969	0.9963	0.9957	0.9949
187	0.9980	0.9976	0.9971	0.9965	0.9959	0.9952
189	0.9982	0.9977	0.9973	0.9967	0.9961	0.9955
193	0.9984	0.9980	0.9976	0.9971	0.9966	0.9960
194	0.9984	0.9981	0.9977	0.9972	0.9967	0.9961
199	0.9987	0.9984	0.9980	0.9976	0.9971	0.9966
201	0.9988	0.9985	0.9981	0.9977	0.9973	0.9968
203	0.9988	0.9986	0.9982	0.9979	0.9974	0.9970
205	0.9989	0.9987	0.9983	0.9980	0.9976	0.9971
208	0.9990	0.9988	0.9985	0.9982	0.9978	0.9974
212	0.9991	0.9989	0.9987	0.9984	0.9980	0.9977
215	0.9992	0.9990	0.9988	0.9985	0.9982	0.9979
218	0.9993	0.9991	0.9989	0.9986	0.9984	0.9980
222	0.9994	0.9992	0.9990	0.9988	0.9985	0.9982
224	0.9994	0.9993	0.9991	0.9989	0.9986	0.9983
228	0.9995	0.9994	0.9992	0.9990	0.9988	0.9985
230	0.9995	0.9994	0.9992	0.9991	0.9988	0.9986
235	0.9996	0.9995	0.9994	0.9992	0.9990	0.9988
237	0.9996	0.9995	0.9994	0.9992	0.9991	0.9989
242	0.9997	0.9996	0.9995	0.9993	0.9992	0.9990
243	0.9997	0.9996	0.9995	0.9994	0.9992	0.9990
249	0.9998	0.9997	0.9996	0.9995	0.9993	0.9992
255	0.9998	0.9997	0.9997	0.9996	0.9994	0.9993
256	0.9998	0.9997	0.9997	0.9996	0.9995	0.9993
262	0.9998	0.9998	0.9997	0.9996	0.9995	0.9994
263	0.9998	0.9998	0.9997	0.9997	0.9996	0.9995
268	0.9999	0.9998	0.9998	0.9997	0.9996	0.9995
270	0.9999	0.9998	0.9998	0.9997	0.9996	0.9996
274	0.9999	0.9999	0.9998	0.9998	0.9997	0.9996
277	0.9999	0.9999	0.9998	0.9998	0.9997	0.9996
284	0.9999	0.9999	0.9999	0.9998	0.9998	0.9997
291	0.9999	0.9999	0.9999	0.9999	0.9998	0.9998
298	1.0000	0.9999	0.9999	0.9999	0.9998	0.9998

Mean time	30	31	32	33	34	35
Lambda (1/Mean time)	0.03	0.03	0.03	0.03	0.03	0.03
Limits for Turnround time						
304	1.0000	0.9999	0.9999	0.9999	0.9999	0.9998
355	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
394	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

Mean time	36	37	38	39	40	41
Lambda (1/Mean time)	0.03	0.03	0.03	0.03	0.03	0.02
Limits for Turnround time						
0.02	0.0006	0.0005	0.0005	0.0005	0.0005	0.0005
0.04	0.0011	0.0011	0.0011	0.0010	0.0010	0.0010
0.06	0.0017	0.0016	0.0016	0.0015	0.0015	0.0015
0.08	0.0022	0.0022	0.0021	0.0020	0.0020	0.0019
0.10	0.0028	0.0027	0.0026	0.0026	0.0025	0.0024
0.12	0.0033	0.0032	0.0032	0.0031	0.0030	0.0029
0.14	0.0039	0.0038	0.0037	0.0036	0.0035	0.0034
0.16	0.0044	0.0043	0.0042	0.0041	0.0040	0.0039
0.18	0.0050	0.0049	0.0047	0.0046	0.0045	0.0044
0.20	0.0055	0.0054	0.0052	0.0051	0.0050	0.0049
0.22	0.0061	0.0059	0.0058	0.0056	0.0055	0.0054
0.24	0.0066	0.0065	0.0063	0.0061	0.0060	0.0058
0.26	0.0072	0.0070	0.0068	0.0066	0.0065	0.0063
0.28	0.0077	0.0075	0.0073	0.0072	0.0070	0.0068
0.30	0.0083	0.0081	0.0079	0.0077	0.0075	0.0073
0.32	0.0088	0.0086	0.0084	0.0082	0.0080	0.0078
0.34	0.0094	0.0091	0.0089	0.0087	0.0085	0.0083
0.36	0.0100	0.0097	0.0094	0.0092	0.0090	0.0087
0.38	0.0105	0.0102	0.0100	0.0097	0.0095	0.0092
0.40	0.0110	0.0108	0.0105	0.0102	0.0100	0.0097
0.42	0.0116	0.0113	0.0110	0.0107	0.0104	0.0102
0.44	0.0121	0.0118	0.0115	0.0112	0.0109	0.0107
0.58	0.0160	0.0156	0.0151	0.0148	0.0144	0.0140
51	0.7575	0.7480	0.7387	0.7296	0.7206	0.7117
56	0.7889	0.7799	0.7709	0.7621	0.7534	0.7448
60	0.8111	0.8024	0.7938	0.7853	0.7769	0.7686
65	0.8356	0.8274	0.8192	0.8111	0.8031	0.7951
69	0.8529	0.8451	0.8373	0.8295	0.8218	0.8142
70	0.8569	0.8492	0.8415	0.8339	0.8262	0.8186
75	0.8755	0.8683	0.8611	0.8538	0.8466	0.8395
76	0.8789	0.8718	0.8647	0.8575	0.8504	0.8433
79	0.8886	0.8818	0.8749	0.8681	0.8612	0.8544
81	0.8946	0.8880	0.8814	0.8747	0.8680	0.8613
83	0.9003	0.8939	0.8874	0.8809	0.8744	0.8679
87	0.9108	0.9048	0.8987	0.8926	0.8864	0.8802
88	0.9132	0.9073	0.9013	0.8953	0.8892	0.8831
90	0.9179	0.9122	0.9064	0.9005	0.8946	0.8887
93	0.9245	0.9190	0.9135	0.9079	0.9022	0.8965
97	0.9324	0.9273	0.9221	0.9169	0.9115	0.9061
102	0.9412	0.9365	0.9317	0.9269	0.9219	0.9169
104	0.9444	0.9398	0.9352	0.9305	0.9257	0.9209
106	0.9474	0.9430	0.9385	0.9340	0.9293	0.9246
111	0.9542	0.9502	0.9461	0.9419	0.9377	0.9333
112	0.9554	0.9515	0.9475	0.9434	0.9392	0.9349
116	0.9601	0.9565	0.9528	0.9489	0.9450	0.9409
118	0.9623	0.9588	0.9552	0.9515	0.9477	0.9438
120	0.9643	0.9610	0.9575	0.9539	0.9502	0.9464
124	0.9681	0.9650	0.9617	0.9584	0.9550	0.9514
125	0.9690	0.9659	0.9627	0.9594	0.9561	0.9526
129	0.9722	0.9694	0.9665	0.9634	0.9602	0.9570
131	0.9737	0.9710	0.9682	0.9652	0.9622	0.9590
132	0.9744	0.9718	0.9690	0.9661	0.9631	0.9600

Mean time	36	37	38	39	40	41
Lambda (1/Mean time)	0.03	0.03	0.03	0.03	0.03	0.02
Limits for Turnround time						
134	0.9758	0.9733	0.9706	0.9678	0.9649	0.9619
137	0.9778	0.9753	0.9728	0.9702	0.9675	0.9646
139	0.9790	0.9766	0.9742	0.9717	0.9690	0.9663
143	0.9812	0.9790	0.9768	0.9744	0.9720	0.9694
146	0.9827	0.9807	0.9786	0.9763	0.9740	0.9716
148	0.9836	0.9817	0.9797	0.9775	0.9753	0.9729
149	0.9841	0.9822	0.9802	0.9781	0.9759	0.9736
152	0.9853	0.9836	0.9817	0.9797	0.9776	0.9755
155	0.9865	0.9848	0.9831	0.9812	0.9792	0.9772
157	0.9872	0.9856	0.9839	0.9821	0.9803	0.9783
159	0.9879	0.9864	0.9848	0.9830	0.9812	0.9793
162	0.9889	0.9875	0.9859	0.9843	0.9826	0.9808
166	0.9901	0.9887	0.9873	0.9858	0.9842	0.9826
168	0.9906	0.9893	0.9880	0.9865	0.9850	0.9834
171	0.9913	0.9902	0.9889	0.9875	0.9861	0.9846
173	0.9918	0.9907	0.9895	0.9882	0.9868	0.9853
174	0.9920	0.9909	0.9897	0.9885	0.9871	0.9856
175	0.9923	0.9912	0.9900	0.9887	0.9874	0.9860
180	0.9933	0.9923	0.9912	0.9901	0.9889	0.9876
185	0.9941	0.9933	0.9923	0.9913	0.9902	0.9890
187	0.9945	0.9936	0.9927	0.9917	0.9907	0.9895
189	0.9948	0.9940	0.9931	0.9921	0.9911	0.9900
193	0.9953	0.9946	0.9938	0.9929	0.9920	0.9910
194	0.9954	0.9947	0.9939	0.9931	0.9922	0.9912
199	0.9960	0.9954	0.9947	0.9939	0.9931	0.9922
201	0.9962	0.9956	0.9950	0.9942	0.9934	0.9926
203	0.9964	0.9959	0.9952	0.9945	0.9937	0.9929
205	0.9966	0.9961	0.9955	0.9948	0.9941	0.9933
208	0.9969	0.9964	0.9958	0.9952	0.9945	0.9937
212	0.9972	0.9968	0.9962	0.9956	0.9950	0.9943
215	0.9975	0.9970	0.9965	0.9960	0.9954	0.9947
218	0.9977	0.9972	0.9968	0.9963	0.9957	0.9951
222	0.9979	0.9975	0.9971	0.9966	0.9961	0.9955
224	0.9980	0.9977	0.9972	0.9968	0.9963	0.9958
228	0.9982	0.9979	0.9975	0.9971	0.9967	0.9962
230	0.9983	0.9980	0.9976	0.9973	0.9968	0.9963
235	0.9985	0.9983	0.9979	0.9976	0.9972	0.9968
237	0.9986	0.9983	0.9980	0.9977	0.9973	0.9969
242	0.9988	0.9986	0.9983	0.9980	0.9976	0.9973
243	0.9988	0.9986	0.9983	0.9980	0.9977	0.9973
249	0.9990	0.9988	0.9986	0.9983	0.9980	0.9977
255	0.9992	0.9990	0.9988	0.9986	0.9983	0.9980
256	0.9992	0.9990	0.9988	0.9986	0.9983	0.9981
262	0.9993	0.9992	0.9990	0.9988	0.9986	0.9983
263	0.9993	0.9992	0.9990	0.9988	0.9986	0.9984
268	0.9994	0.9993	0.9991	0.9990	0.9988	0.9986
270	0.9994	0.9993	0.9992	0.9990	0.9988	0.9986
274	0.9995	0.9994	0.9993	0.9991	0.9989	0.9987
277	0.9995	0.9994	0.9993	0.9992	0.9990	0.9988
284	0.9996	0.9995	0.9994	0.9993	0.9992	0.9990
291	0.9997	0.9996	0.9995	0.9994	0.9993	0.9992
298	0.9997	0.9997	0.9996	0.9995	0.9994	0.9993

Mean time	36	37	38	39	40	41
Lambda (1/Mean time)	0.03	0.03	0.03	0.03	0.03	0.02
Limits for Turnround time						
304	0.9998	0.9997	0.9997	0.9996	0.9995	0.9994
355	0.9999	0.9999	0.9999	0.9999	0.9999	0.9998
394	1.0000	1.0000	1.0000	1.0000	0.9999	0.9999

Mean time	42	43	44	57
Lambda (1/Mean time)	0.02	0.02	0.02	0.02
Limits for Turnround time				
0.02	0.0005	0.0005	0.0005	0.0004
0.04	0.0010	0.0009	0.0009	0.0007
0.06	0.0014	0.0014	0.0014	0.0011
0.08	0.0019	0.0019	0.0018	0.0014
0.10	0.0024	0.0023	0.0023	0.0018
0.12	0.0029	0.0028	0.0027	0.0021
0.14	0.0033	0.0033	0.0032	0.0025
0.16	0.0038	0.0037	0.0036	0.0028
0.18	0.0043	0.0042	0.0041	0.0032
0.20	0.0048	0.0046	0.0045	0.0035
0.22	0.0052	0.0051	0.0050	0.0039
0.24	0.0057	0.0056	0.0054	0.0042
0.26	0.0062	0.0060	0.0059	0.0046
0.28	0.0066	0.0065	0.0063	0.0049
0.30	0.0071	0.0070	0.0068	0.0052
0.32	0.0076	0.0074	0.0072	0.0056
0.34	0.0081	0.0079	0.0077	0.0059
0.36	0.0085	0.0083	0.0081	0.0063
0.38	0.0090	0.0088	0.0086	0.0066
0.40	0.0095	0.0093	0.0090	0.0070
0.42	0.0100	0.0097	0.0095	0.0073
0.44	0.0104	0.0102	0.0100	0.0077
0.58	0.0137	0.0134	0.0131	0.0101
51	0.7031	0.6946	0.6862	0.5913
56	0.7364	0.7281	0.7199	0.6256
60	0.7603	0.7523	0.7443	0.6510
65	0.7872	0.7794	0.7717	0.6803
69	0.8066	0.7990	0.7916	0.7020
70	0.8111	0.8037	0.7963	0.7071
75	0.8323	0.8252	0.8181	0.7317
76	0.8363	0.8292	0.8222	0.7364
79	0.8476	0.8407	0.8339	0.7499
81	0.8546	0.8480	0.8413	0.7585
83	0.8614	0.8549	0.8484	0.7669
87	0.8740	0.8678	0.8616	0.7827
88	0.8770	0.8708	0.8647	0.7864
90	0.8827	0.8767	0.8707	0.7938
93	0.8908	0.8850	0.8792	0.8044
97	0.9007	0.8952	0.8897	0.8176
102	0.9118	0.9067	0.9015	0.8330
104	0.9159	0.9110	0.9059	0.8387
106	0.9198	0.9150	0.9101	0.8443
111	0.9288	0.9243	0.9198	0.8574
112	0.9305	0.9261	0.9216	0.8598
116	0.9368	0.9326	0.9284	0.8693
118	0.9398	0.9357	0.9316	0.8738
120	0.9426	0.9386	0.9346	0.8782
124	0.9478	0.9441	0.9403	0.8864
125	0.9490	0.9454	0.9416	0.8884
129	0.9536	0.9502	0.9467	0.8960
131	0.9558	0.9525	0.9491	0.8996
132	0.9568	0.9536	0.9502	0.9013

Mean time	42	43	44	57
Lambda (1/Mean time)	0.02	0.02	0.02	0.02
Limits for Turnround time				
134	0.9588	0.9557	0.9524	0.9047
137	0.9617	0.9587	0.9556	0.9096
139	0.9635	0.9605	0.9575	0.9127
143	0.9668	0.9640	0.9612	0.9186
146	0.9691	0.9665	0.9638	0.9228
148	0.9705	0.9680	0.9654	0.9255
149	0.9712	0.9687	0.9662	0.9268
152	0.9732	0.9708	0.9684	0.9305
155	0.9750	0.9728	0.9705	0.9341
157	0.9762	0.9740	0.9718	0.9364
159	0.9773	0.9752	0.9730	0.9385
162	0.9789	0.9769	0.9748	0.9417
166	0.9808	0.9789	0.9770	0.9456
168	0.9817	0.9799	0.9780	0.9475
171	0.9829	0.9813	0.9795	0.9502
173	0.9837	0.9821	0.9804	0.9519
174	0.9841	0.9825	0.9808	0.9528
175	0.9845	0.9829	0.9813	0.9536
180	0.9862	0.9848	0.9833	0.9575
185	0.9878	0.9865	0.9851	0.9611
187	0.9883	0.9871	0.9857	0.9624
189	0.9889	0.9877	0.9864	0.9637
193	0.9899	0.9888	0.9876	0.9662
194	0.9901	0.9890	0.9878	0.9667
199	0.9912	0.9902	0.9891	0.9695
201	0.9917	0.9907	0.9896	0.9706
203	0.9920	0.9911	0.9901	0.9716
205	0.9924	0.9915	0.9905	0.9726
208	0.9929	0.9921	0.9911	0.9740
212	0.9936	0.9928	0.9919	0.9757
215	0.9940	0.9933	0.9925	0.9770
218	0.9944	0.9937	0.9929	0.9782
222	0.9949	0.9943	0.9936	0.9797
224	0.9952	0.9945	0.9938	0.9804
228	0.9956	0.9950	0.9944	0.9817
230	0.9958	0.9952	0.9946	0.9823
235	0.9963	0.9958	0.9952	0.9838
237	0.9965	0.9960	0.9954	0.9844
242	0.9969	0.9964	0.9959	0.9857
243	0.9969	0.9965	0.9960	0.9859
249	0.9973	0.9969	0.9965	0.9873
255	0.9977	0.9973	0.9970	0.9886
256	0.9977	0.9974	0.9970	0.9888
262	0.9980	0.9977	0.9974	0.9899
263	0.9981	0.9978	0.9975	0.9901
268	0.9983	0.9980	0.9977	0.9909
270	0.9984	0.9981	0.9978	0.9912
274	0.9985	0.9983	0.9980	0.9918
277	0.9986	0.9984	0.9982	0.9922
284	0.9988	0.9986	0.9984	0.9931
291	0.9990	0.9988	0.9987	0.9939
298	0.9992	0.9990	0.9989	0.9946

Mean time	42	43	44	57
Lambda (1/Mean time)	0.02	0.02	0.02	0.02
Limits for Turnround time				
304	0.9993	0.9991	0.9990	0.9952
355	0.9998	0.9997	0.9997	0.9980
394	0.9999	0.9999	0.9999	0.9990

Appendix 5

Normality Tests

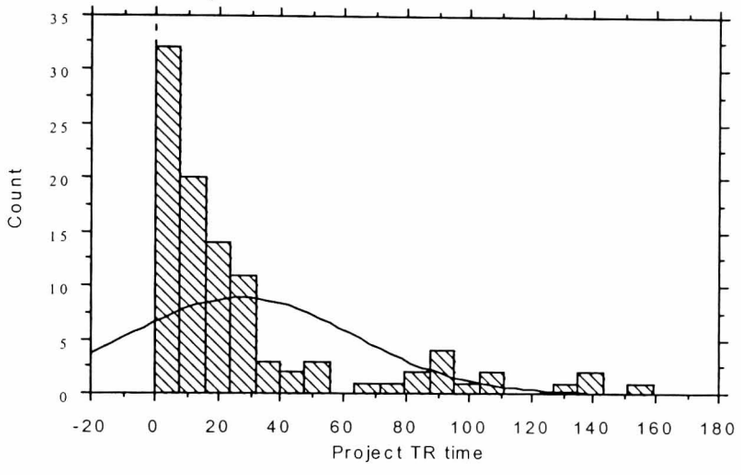
Descriptive Statistics
DataBakery.svd

	Project TR time
Mean	27.450
Std. Dev.	35.820
Count	100
Minimum	0.000
Maximum	159.000
Skewness	1.911
Kurtosis	3.013

Kolmogorov-Smirnov Test for Measurements
Grouping Variable: Actual/Ideal Measures

DF	2
Count, Actual	100
Count, Ideal Normal	100
Maximum Difference	.240
Chi Square	11.520
P-Value	.0063

Histogram
DataBakery.svd



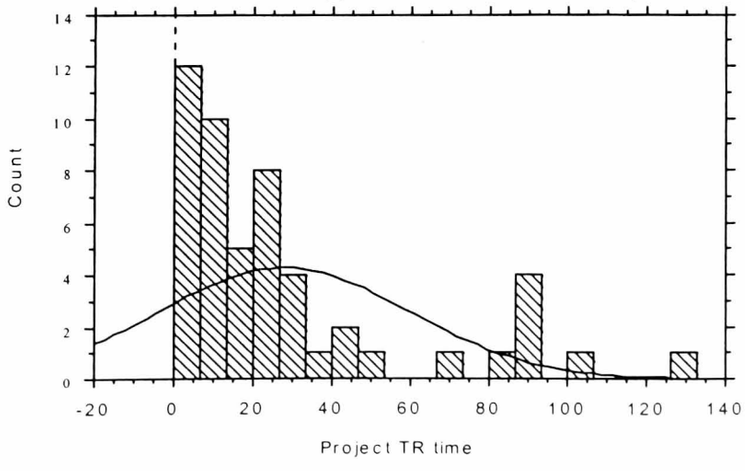
Descriptive Statistics
Inclusion criteria: Application from DataBakery.svd

	Project TR time
Mean	27.863
Std. Dev.	31.635
Count	51
Minimum	0.000
Maximum	133.000
Skewness	1.636
Kurtosis	1.785

Kolmogorov-Smirnov Test for Measurements
Grouping Variable: Actual/Ideal Measures

DF	2
Count, Actual	51
Count, Ideal Normal	51
Maximum Difference	.235
Chi Square	5.647
P-Value	.1188

Histogram
Inclusion criteria: Application from DataBakery.svd



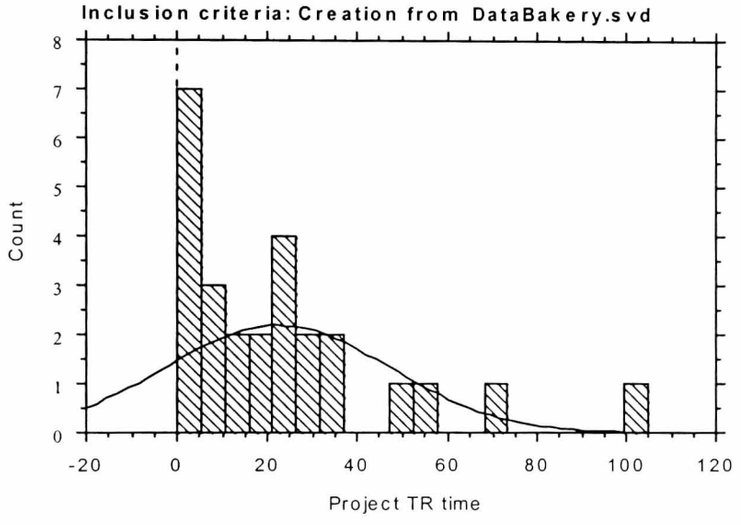
Descriptive Statistics
Inclusion criteria: Creation from DataBakery.svd

	Project TR time
Mean	22.308
Std. Dev.	24.870
Count	26
Minimum	0.000
Maximum	105.000
Skewness	1.726
Kurtosis	3.019

Kolmogorov-Smirnov Test for Measurements
Grouping Variable: Actual/Ideal Measures

DF	2
Count, Actual	26
Count, Ideal Normal	26
Maximum Difference	.192
Chi Square	1.923
P-Value	.7646

Histogram
Inclusion criteria: Creation from DataBakery.svd



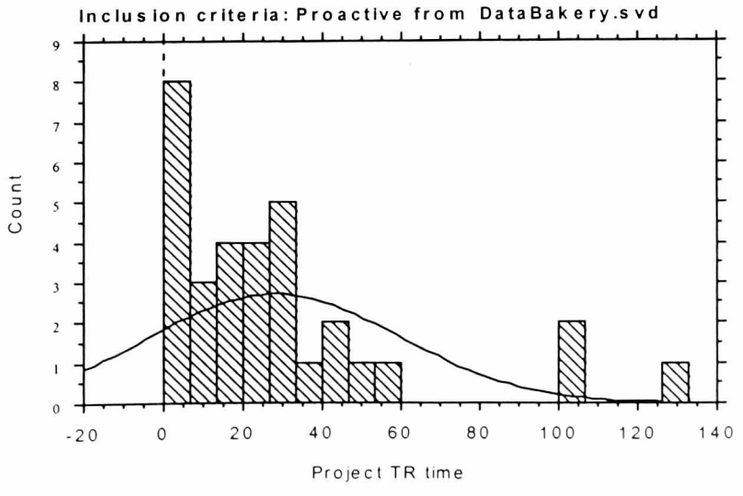
Descriptive Statistics
Inclusion criteria: Proactive from DataBakery.svd

	Project TR time
Mean	28.094
Std. Dev.	31.443
Count	32
Minimum	0.000
Maximum	133.000
Skewness	1.945
Kurtosis	3.391

Kolmogorov-Smirnov Test for Measurements
Grouping Variable: Actual/Ideal Measures

DF	2
Count, Actual	32
Count, Ideal Normal	32
Maximum Difference	.219
Chi Square	3.063
P-Value	.4325

Histogram
Inclusion criteria: Proactive from DataBakery.svd



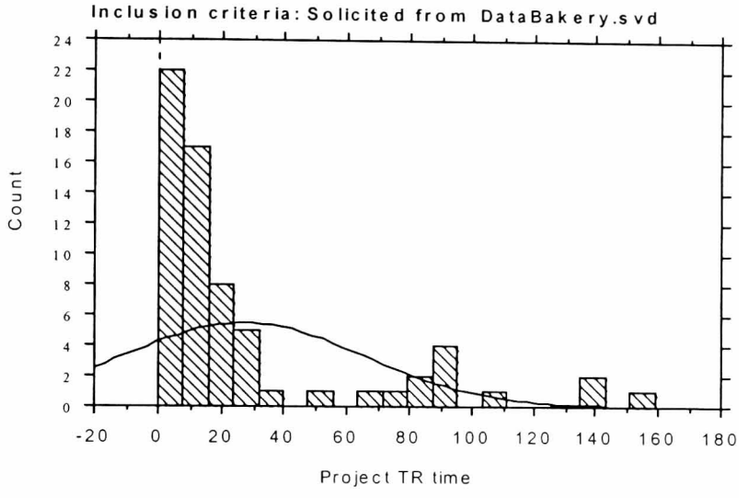
Descriptive Statistics
Inclusion criteria: Solicited from DataBakery.svd

	Project TR time
Mean	27.470
Std. Dev.	38.346
Count	66
Minimum	0.000
Maximum	159.000
Skewness	1.860
Kurtosis	2.611

Kolmogorov-Smirnov Test for Measurements
Grouping Variable: Actual/Ideal Measures

DF	2
Count, Actual	66
Count, Ideal Normal	66
Maximum Difference	.288
Chi Square	10.939
P-Value	.0084

Histogram
Inclusion criteria: Solicited from DataBakery.svd



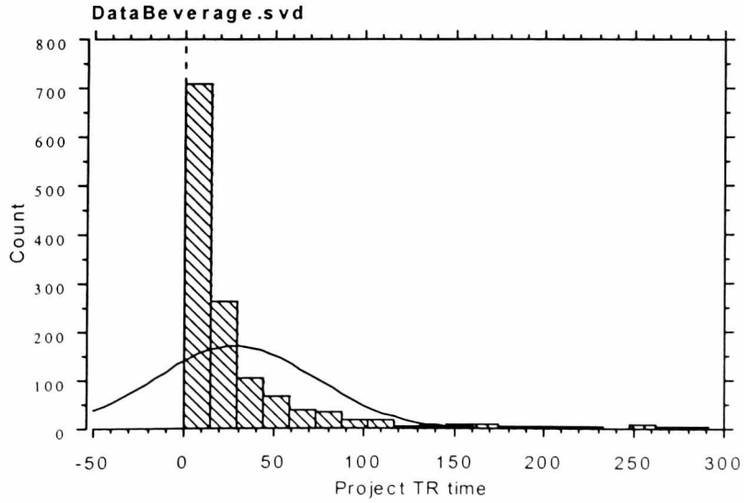
Descriptive Statistics
DataBeverage.svd

	Project TR time
Mean	28.015
Std. Dev.	44.581
Count	1303
Minimum	0.000
Maximum	292.000
Skewness	3.256
Kurtosis	12.133

Kolmogorov-Smirnov Test for Measurements
Grouping Variable: Actual/Ideal Measures

DF	2
Count, Actual	1303
Count, Ideal Normal	1303
Maximum Difference	.265
Chi Square	182.694
P-Value	<.0001

Histogram
DataBeverage.svd



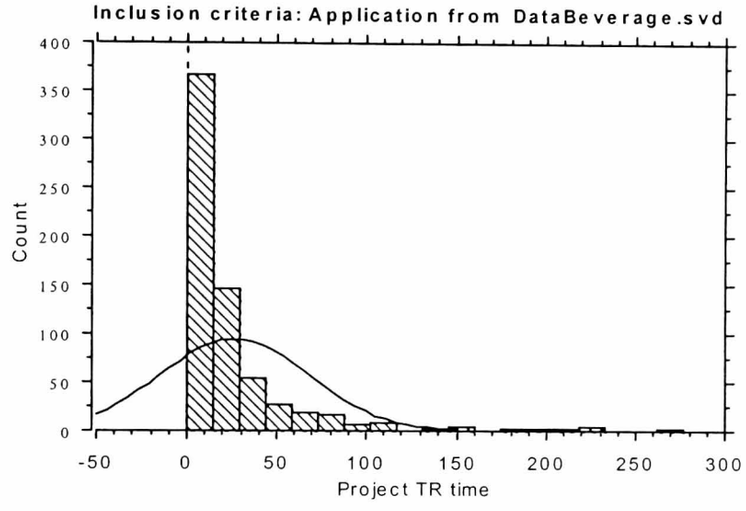
Descriptive Statistics
Inclusion criteria: Application from DataBeverage.svd

	Project TR time
Mean	26.503
Std. Dev.	41.321
Count	670
Minimum	0.000
Maximum	292.000
Skew ness	3.367
Kurtosis	13.088

Kolmogorov-Smirnov Test for Measurements
Grouping Variable: Actual/Ideal Measures

DF	2
Count, Actual	670
Count, Ideal Normal	670
Maximum Difference	.261
Chi Square	91.418
P-Value	<.0001

Histogram
Inclusion criteria: Application from DataBeverage.svd



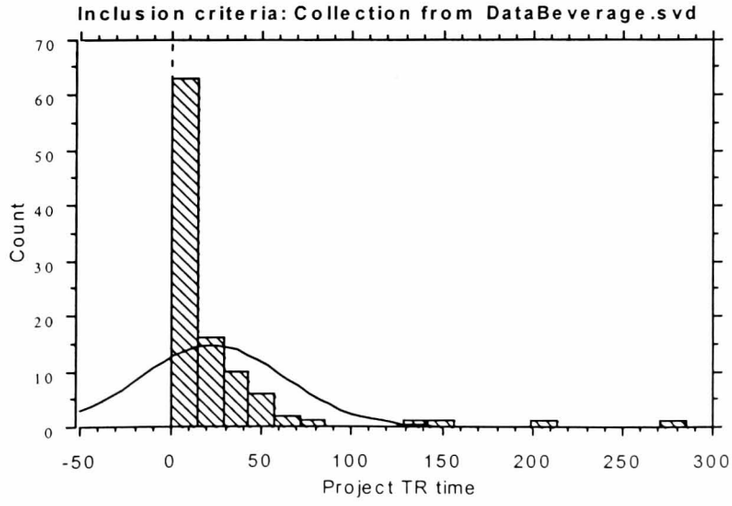
Descriptive Statistics
Inclusion criteria: Collection from DataBeverage.svd

	Project TR time
Mean	22.765
Std. Dev.	40.015
Count	102
Minimum	0.000
Maximum	285.000
Skew ness	4.219
Kurtosis	21.084

Kolmogorov-Smirnov Test for Measurements
Grouping Variable: Actual/Ideal Measures

DF	2
Count, Actual	102
Count, Ideal Normal	102
Maximum Difference	.284
Chi Square	16.490
P-Value	.0005

Histogram
Inclusion criteria: Collection from DataBeverage.svd



Descriptive Statistics

Inclusion criteria: Creation from DataBeverage.svd

	Project TR time
Mean	35.418
Std. Dev.	51.124
Count	402
Minimum	0.000
Maximum	278.000
Skew ness	2.801
Kurtosis	8.568

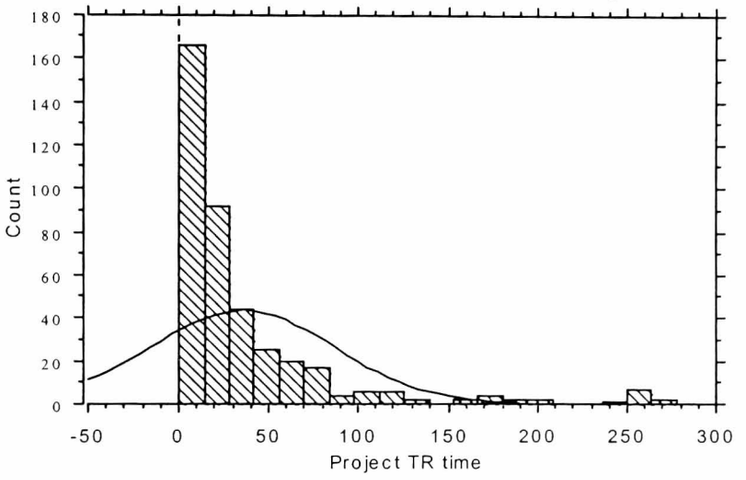
Kolmogorov-Smirnov Test for Measurements

Grouping Variable: Actual/Ideal Measures

DF	2
Count, Actual	402
Count, Ideal Normal	402
Maximum Difference	.244
Chi Square	47.781
P-Value	<.0001

Histogram

Inclusion criteria: Creation from DataBeverage.svd



Descriptive Statistics

Inclusion criteria: Proactive from DataBeverage.svd

	Project TR time
Mean	43.901
Std. Dev.	60.819
Count	272
Minimum	0.000
Maximum	292.000
Skew ness	2.157
Kurtosis	4.226

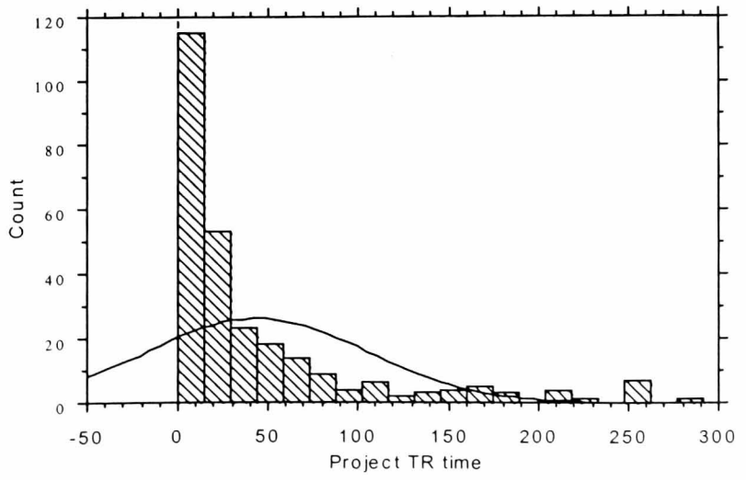
Kolmogorov-Smirnov Test for Measurements

Grouping Variable: Actual/Ideal Measures

DF	2
Count, Actual	272
Count, Ideal Normal	272
Maximum Difference	.235
Chi Square	30.118
P-Value	<.0001

Histogram

Inclusion criteria: Proactive from DataBeverage.svd



Descriptive Statistics

Inclusion criteria: Solicited from DataBeverage.svd

	Project TR time
Mean	23.796
Std. Dev.	38.075
Count	1020
Minimum	0.000
Maximum	285.000
Skewness	3.785
Kurtosis	17.799

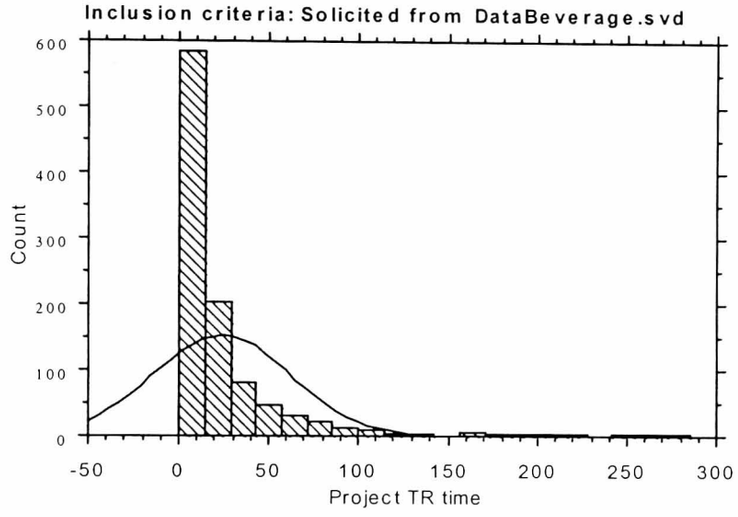
Kolmogorov-Smirnov Test for Measurements

Grouping Variable: Actual/Ideal Measures

DF	2
Count, Actual	1020
Count, Ideal Normal	1020
Maximum Difference	.266
Chi Square	144.002
P-Value	<.0001

Histogram

Inclusion criteria: Solicited from DataBeverage.svd



Descriptive Statistics

DataConfectionary.svd

	Project TR time
Mean	29.196
Std. Dev.	44.913
Count	398
Minimum	0.000
Maximum	276.000
Skewness	3.071
Kurtosis	10.560

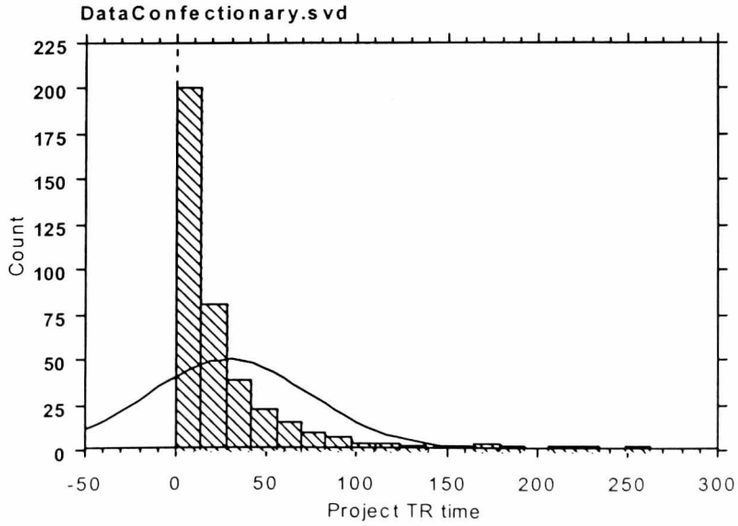
Kolmogorov-Smirnov Test for Measurements

Grouping Variable: Actual/Ideal Measures

DF	**2**
Count, Actual	**398**
Count, Ideal Normal	**398**
Maximum Difference	**.259**
Chi Square	**53.312**
P-Value	**<.0001**

Histogram

DataConfectionary.svd



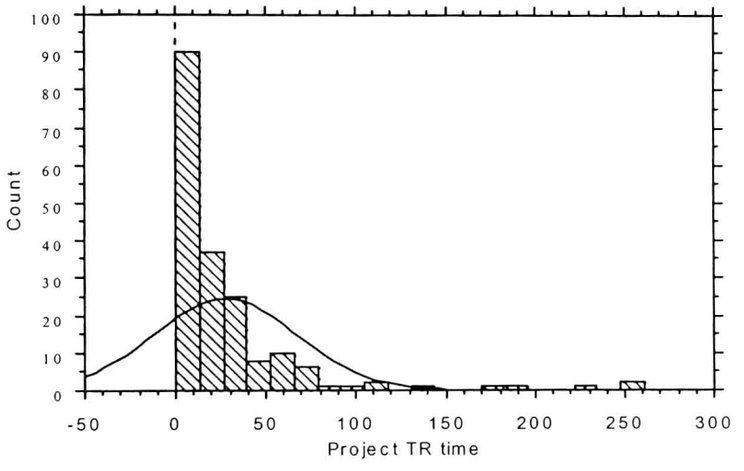
Descriptive Statistics
Inclusion criteria: Application from DataConfectionery.svd

	Project TR time
Mean	27.688
Std. Dev.	39.743
Count	186
Minimum	0.000
Maximum	261.000
Skewness	3.597
Kurtosis	15.290

Kolmogorov-Smirnov Test for Measurements
Grouping Variable: Actual/Ideal Measures

DF	2
Count, Actual	186
Count, Ideal Normal	186
Maximum Difference	.242
Chi Square	21.774
P-Value	<.0001

Histogram
Inclusion criteria: Application from DataConfectionery.svd



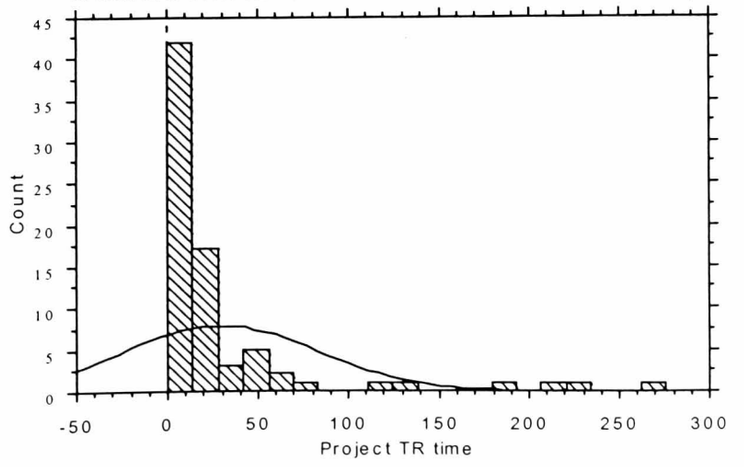
Descriptive Statistics
Inclusion criteria: Collection from DataConfectionery.svd

	Project TR time
Mean	28.803
Std. Dev.	53.299
Count	76
Minimum	0.000
Maximum	276.000
Skewness	3.056
Kurtosis	9.205

Kolmogorov-Smirnov Test for Measurements
Grouping Variable: Actual/Ideal Measures

DF	2
Count, Actual	76
Count, Ideal Normal	76
Maximum Difference	.289
Chi Square	12.737
P-Value	.0034

Histogram
Inclusion criteria: Collection from DataConfectionery.svd



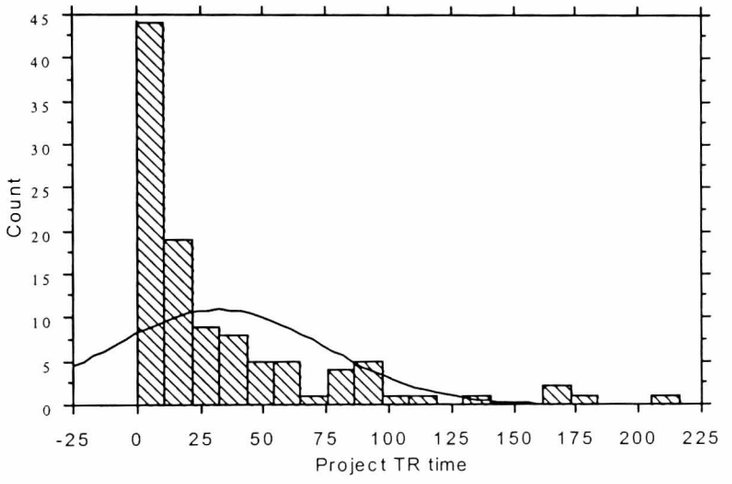
Descriptive Statistics
Inclusion criteria: Creation from DataConfectionery.svd

	Project TR time
Mean	32.299
Std. Dev.	42.163
Count	107
Minimum	0.000
Maximum	216.000
Skew ness	2.109
Kurtosis	4.651

Kolmogorov-Smirnov Test for Measurements
Grouping Variable: Actual/Ideal Measures

DF	2
Count, Actual	107
Count, Ideal Normal	107
Maximum Difference	.224
Chi Square	10.766
P-Value	.0092

Histogram
Inclusion criteria: Creation from DataConfectionery.svd



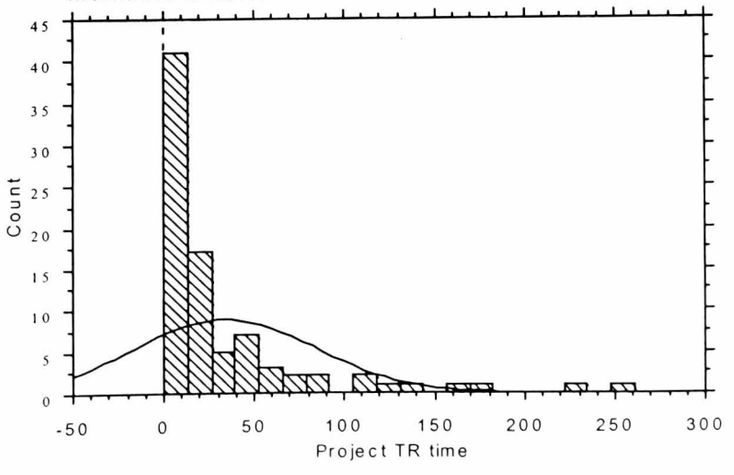
Descriptive Statistics
Inclusion criteria: Proactive from DataConfectionery.svd

	Project TR time
Mean	33.447
Std. Dev.	49.801
Count	85
Minimum	0.000
Maximum	261.000
Skew ness	2.579
Kurtosis	7.019

Kolmogorov-Smirnov Test for Measurements
Grouping Variable: Actual/Ideal Measures

DF	2
Count, Actual	85
Count, Ideal Normal	85
Maximum Difference	.247
Chi Square	10.376
P-Value	.0112

Histogram
Inclusion criteria: Proactive from DataConfectionery.svd



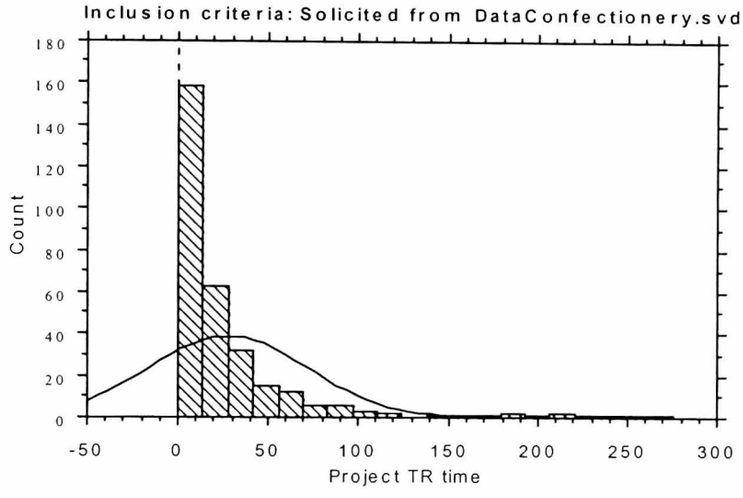
Descriptive Statistics
Inclusion criteria: Solicited from DataConfectionery.svd

	Project TR time
Mean	28.029
Std. Dev.	43.759
Count	309
Minimum	0.000
Maximum	276.000
Skewness	3.226
Kurtosis	11.785

Kolmogorov-Smirnov Test for Measurements
Grouping Variable: Actual/Ideal Measures

DF	2
Count, Actual	309
Count, Ideal Normal	309
Maximum Difference	.262
Chi Square	42.466
P-Value	<.0001

Histogram
Inclusion criteria: Solicited from DataConfectionery.svd



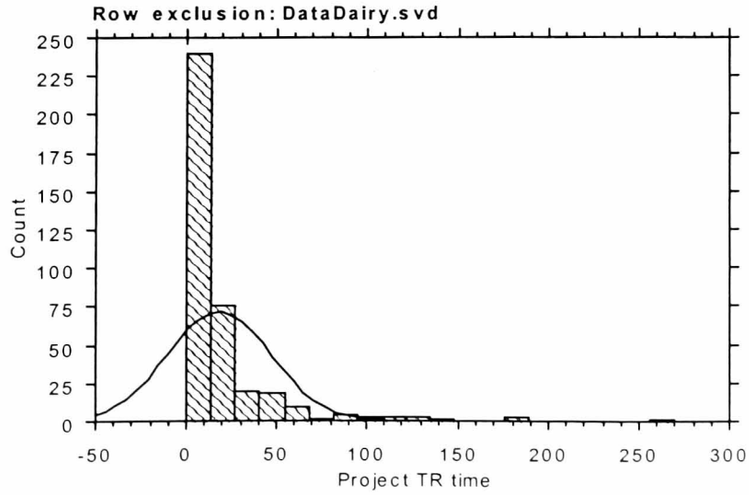
Descriptive Statistics
Row exclusion: DataDairy.svd

	Project TR time
Mean	17.979
Std. Dev.	28.606
Count	379
Minimum	0.000
Maximum	270.000
Skewness	4.127
Kurtosis	23.459

Kolmogorov-Smirnov Test for Measurements
Grouping Variable: Actual/Ideal Measures

DF	2
Count, Actual	379
Count, Ideal Normal	379
Maximum Difference	.264
Chi Square	52.770
P-Value	<.0001

Histogram
Row exclusion: DataDairy.svd



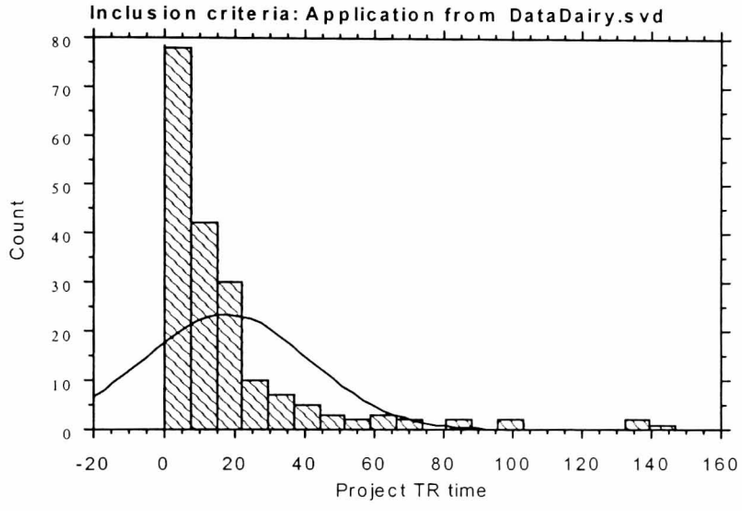
Descriptive Statistics
Inclusion criteria: Application from DataDairy.svd

	Project TR time
Mean	17.571
Std. Dev.	23.774
Count	189
Minimum	0.000
Maximum	147.000
Skew ness	2.977
Kurtosis	10.485

Kolmogorov-Smirnov Test for Measurements
Grouping Variable: Actual/Ideal Measures

DF	2
Count, Actual	189
Count, Ideal Normal	189
Maximum Difference	.228
Chi Square	19.566
P-Value	.0001

Histogram
Inclusion criteria: Application from DataDairy.svd



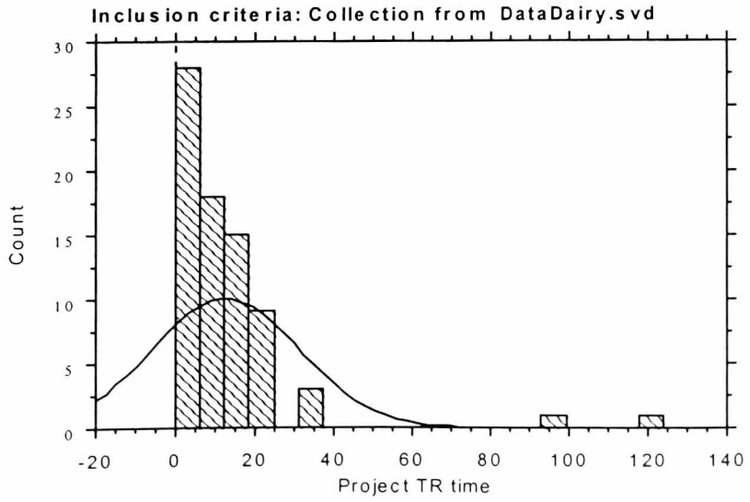
Descriptive Statistics
Inclusion criteria: Collection from DataDairy.svd

	Project TR time
Mean	12.600
Std. Dev.	18.555
Count	75
Minimum	0.000
Maximum	124.000
Skew ness	4.303
Kurtosis	21.342

Kolmogorov-Smirnov Test for Measurements
Grouping Variable: Actual/Ideal Measures

DF	2
Count, Actual	75
Count, Ideal Normal	75
Maximum Difference	.253
Chi Square	9.627
P-Value	.0162

Histogram
Inclusion criteria: Collection from DataDairy.svd



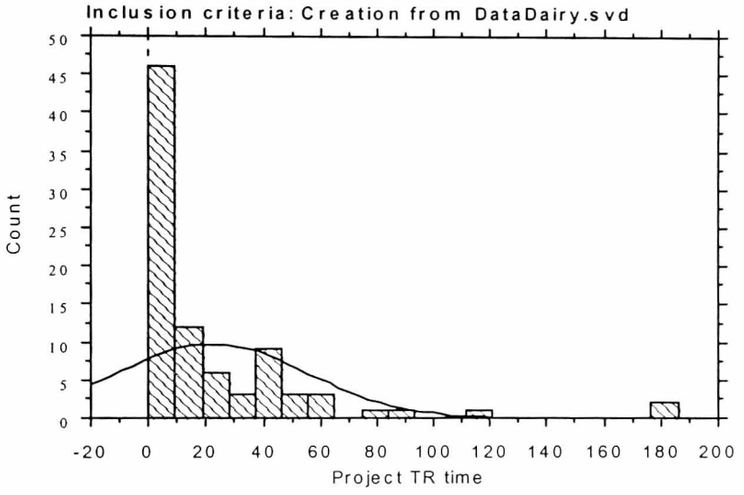
Descriptive Statistics
Inclusion criteria: Creation from DataDairy.svd

	Project TR time
Mean	22.218
Std. Dev.	33.117
Count	87
Minimum	0.000
Maximum	186.000
Skewness	3.024
Kurtosis	10.883

Kolmogorov-Smirnov Test for Measurements
Grouping Variable: Actual/Ideal Measures

DF	2
Count, Actual	87
Count, Ideal Normal	87
Maximum Difference	.253
Chi Square	11.126
P-Value	.0077

Histogram
Inclusion criteria: Creation from DataDairy.svd



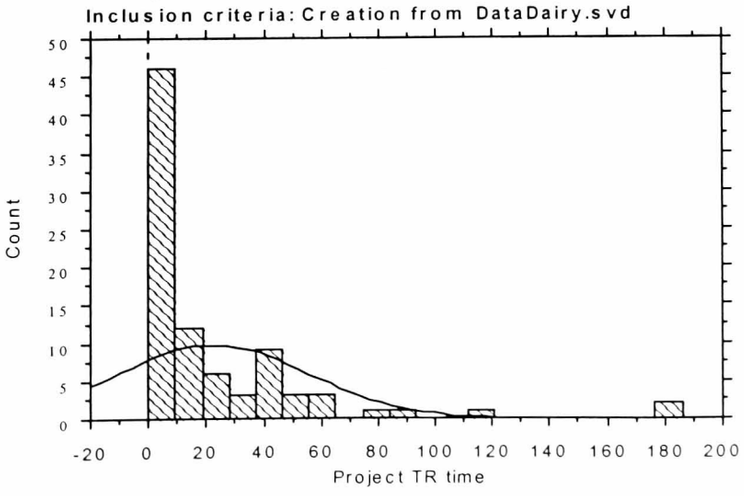
Descriptive Statistics
Inclusion criteria: Creation from DataDairy.svd

	Project TR time
Mean	22.218
Std. Dev.	33.117
Count	87
Minimum	0.000
Maximum	186.000
Skewness	3.024
Kurtosis	10.883

Kolmogorov-Smirnov Test for Measurements
Grouping Variable: Actual/Ideal Measures

DF	2
Count, Actual	87
Count, Ideal Normal	87
Maximum Difference	.253
Chi Square	11.126
P-Value	.0077

Histogram
Inclusion criteria: Creation from DataDairy.svd



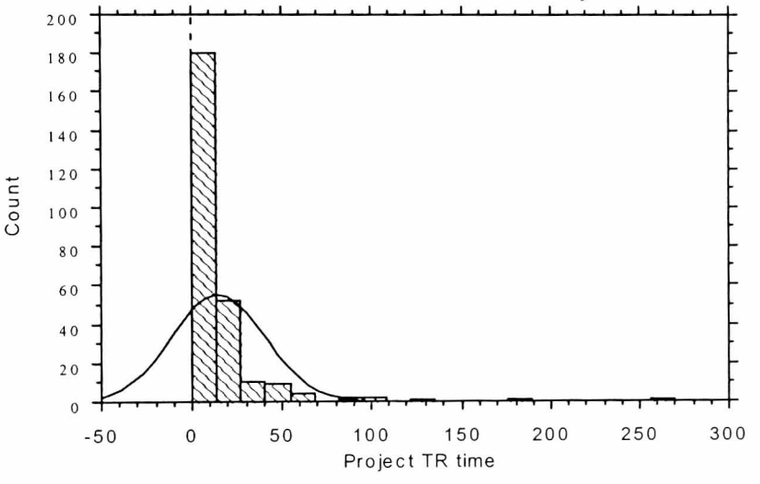
Descriptive Statistics
Inclusion criteria: Solicited from DataDairy.svd

	Project TR time
Mean	14.523
Std. Dev.	25.565
Count	262
Minimum	0.000
Maximum	270.000
Skewness	5.819
Kurtosis	46.003

Kolmogorov-Smirnov Test for Measurements
Grouping Variable: Actual/Ideal Measures

DF	2
Count, Actual	262
Count, Ideal Normal	262
Maximum Difference	.286
Chi Square	42.939
P-Value	<.0001

Histogram
Inclusion criteria: Solicited from DataDairy.svd



Appendix 6

Out of Control Signals Raw Data Tables

Bakery BU

	All Projects		Application		Creation		Proactive		Solicited	
	Outside	Run	Outside	Run	Outside	Run	Outside	Run	Outside	Run
Mean/Control	6	11	2	4	1	0	1	2	4	10
Median	10	2	7	1	1	0	2	2	4	6
10% Trimmed Mean	6	5	6	1	1	0	2	2	4	5
Resampled Mean	5	5	1	4	1	0	2	2	4	10
1/1000 Probability Limits	3		2		1		1		2	
Exponential Model	1		0		1		0		1	
1/1000 Resampled Limits	0		0		0		0		0	

Beverage BU

	All Projects		Application		Creation		Collection		Proactive		Solicited	
	Outside	Run	Outside	Run	Outside	Run	Outside	Run	Outside	Run	Outside	Run
Mean/Control	72	150	36	93	26	28	10	41	28	80	41	102
Median	113	44	46	34	29	14	12	5	37	23	56	34
10% Trimmed Mean	83	47	41	31	27	12	11	2	31	27	54	66
Resampled Mean	61	152	28	118	20	42	7	23	16	52	39	124
1/1000 Probability Limits	59		32		21		10		22		35	
Exponential Model	16		13		2		0		1		14	
1/1000 Resampled Limits	0		0		0		0		0		2	

Confectionery BU

	All Projects		Application		Creation		Collection		Proactive		Solicited	
	Outside	Run	Outside	Run	Outside	Run	Outside	Run	Outside	Run	Outside	Run
Mean/Control	20	39	8	18	4	8	5	19	4	5	15	27
Median	26	20	10	8	8	4	6	2	6	3	15	19
10% Trimmed Mean	23	19	9	8	5	5	6	2	5	3	15	16
Resampled Mean	18	43	7	13	5	2	5	21	4	4	13	38
1/1000 Probability Limits	19		8		4		5		4		14	
Exponential Model	5		2		0		2		1		4	
1/1000 Resampled Limits	1		0		0		0		0		0	

Dairy BU

	All Projects		Application		Creation		Collection		Proactive		Solicited	
	Outside	Run	Outside	Run	Outside	Run	Outside	Run	Outside	Run	Outside	Run
Mean/Control	19	49	8	12	3	6	2	1	5	15	13	42
Median	22	19	10	5	3	6	2	1	6	4	15	9
10% Trimmed Mean	22	15	9	6	5	11	2	1	6	6	14	7
Resampled Mean	17	31	7	12	4	12	2	1	6	15	8	14

1/1000 Probability Limits	15		8		3		2		5		12	
Exponential Model	3		1		2		2		1		2	
1/1000 Resampled Limits	0		0		0		0		0		0	

Appendix 7

Out of Control Signals as a Percentage

Bakery BU % Scores

	All Projects		Application		Creation		Proactive		Solicited	
	Outside	Run	Outside	Run	Outside	Run	Outside	Run	Outside	Run
Mean/Control	5.94	10.89	3.92	7.84	3.70	0.00	3.13	6.25	5.97	14.93
Median	9.90	1.98	13.73	1.96	3.70	0.00	6.25	6.25	5.97	8.96
10% Trimmed Mean	5.94	4.95	11.76	1.96	3.70	0.00	6.25	6.25	5.97	7.46
Resampled Mean	4.95	4.95	1.96	7.84	3.70	0.00	6.25	6.25	5.97	14.93
1/1000 Probability Limits	2.97		3.92		3.70		3.13		2.99	
Exponential Model	0.99		0.00		3.70		0.00		1.49	
1/1000 Resampled Limits	0.00		0.00		0.00		0.00		0.00	

Beverage BU % Scores

	All Projects		Application		Creation		Collection		Proactive		Solicited	
	Outside	**Run**	**Outside**	**Run**	**Outside**	**Run**	**Outside**	**Run**	**Outside**	**Run**	**Outside**	**Run**
Mean/Control	5.49	11.43	5.36	13.84	6.47	6.97	9.26	37.96	10.04	28.67	4.01	9.98
Median	8.61	3.35	6.85	5.06	7.21	3.48	11.11	4.63	13.26	8.24	5.48	3.33
10% Trimmed Mean	6.33	3.58	6.10	4.61	6.72	2.99	10.19	1.85	11.11	9.68	5.28	6.46
Resampled Mean	4.65	11.59	4.17	17.56	4.98	10.45	6.48	21.30	5.73	18.64	3.82	12.13
1/1000 Probability Limits	4.50		4.76		5.22		9.26		7.89		3.42	
Exponential Model	1.22		1.93		0.50		0.00		0.36		1.37	
1/1000 Resampled Limits	0.00		0.00		0.00		0.00		0.00		0.20	

Confectionery BU % Scores

	All Projects		Application		Creation		Collection		Proactive		Solicited	
	Outside	Run	Outside	Run	Outside	Run	Outside	Run	Outside	Run	Outside	Run
Mean/Control	5.01	9.77	4.30	9.68	3.74	7.48	6.49	24.68	4.71	5.88	4.84	8.71
Median	6.52	5.01	5.38	4.30	7.48	3.74	7.79	2.60	7.06	3.53	4.84	6.13
10% Trimmed Mean	5.76	4.76	4.84	4.30	4.67	4.67	7.79	2.60	5.88	3.53	4.84	5.16
Resampled Mean	4.51	10.78	3.76	6.99	4.67	1.87	6.49	27.27	4.71	4.71	4.19	12.26
1/1000 Probability Limits	4.76		4.30		3.74		6.49		4.71		4.52	
Exponential Model	1.25		1.08		0.00		2.60		1.18		1.29	
1/1000 Resampled Limits	0.25		0.00		0.00		0.00		0.00		0.00	

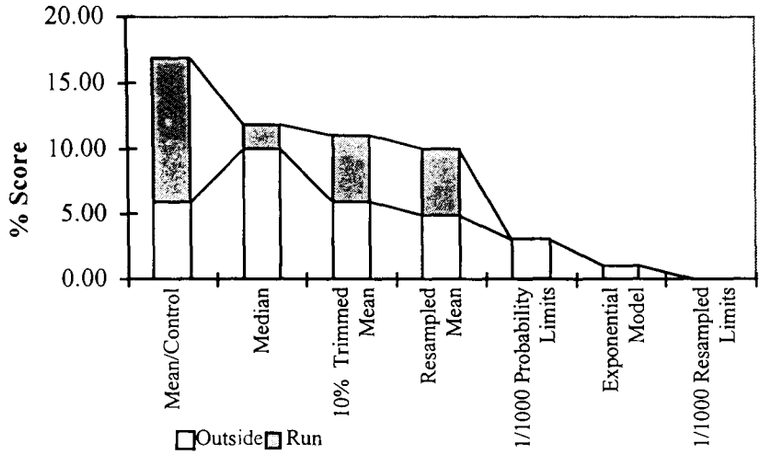
Dairy BU % Scores

	All Projects		Application		Creation		Collection		Proactive		Solicited	
	Outside	Run	Outside	Run	Outside	Run	Outside	Run	Outside	Run	Outside	Run
Mean/Control	5.01	12.93	4.23	6.35	3.45	6.90	2.67	1.33	4.42	13.27	4.96	16.03
Median	5.80	5.01	5.29	2.65	3.45	6.90	2.67	1.33	5.31	3.54	5.73	3.44
10% Trimmed Mean	5.80	3.96	4.76	3.17	5.75	12.64	2.67	1.33	5.31	5.31	5.34	2.67
Resampled Mean	4.49	8.18	3.70	6.35	4.60	13.79	2.67	1.33	5.31	13.27	3.05	5.34
1/1000 Probability Limits	3.96		4.23		3.45		2.67		4.42		4.58	
Exponential Model	0.79		0.53		2.30		2.67		0.88		0.76	
1/1000 Resampled Limits	0.00		0.00		0.00		0.00		0.00		0.00	

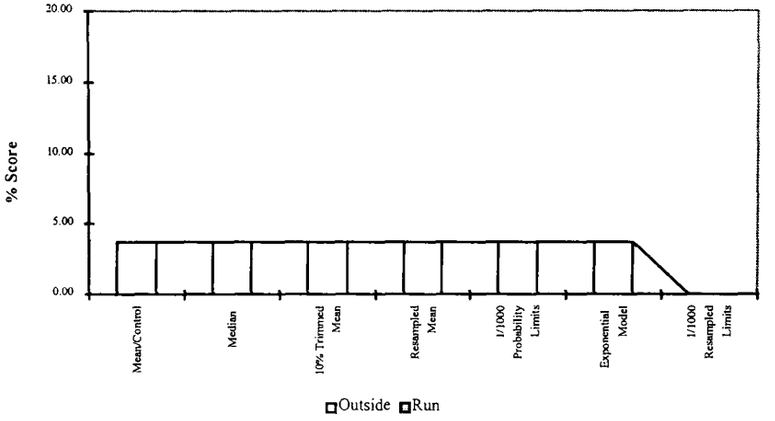
Appendix 8

Complete set of Histograms for all Methods

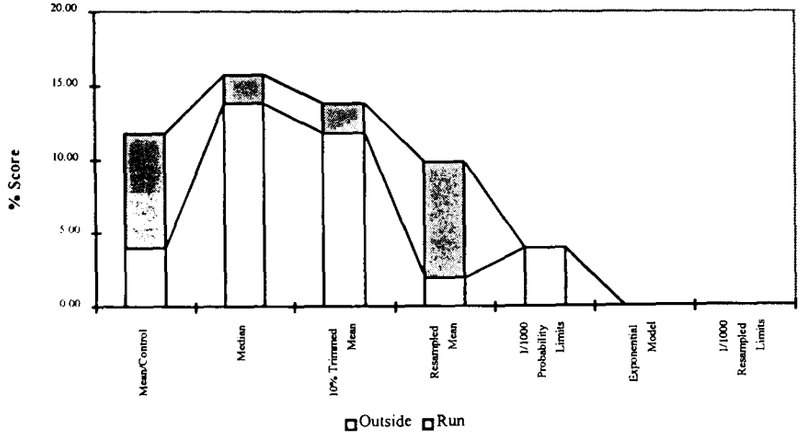
Bakery BU - All Projects



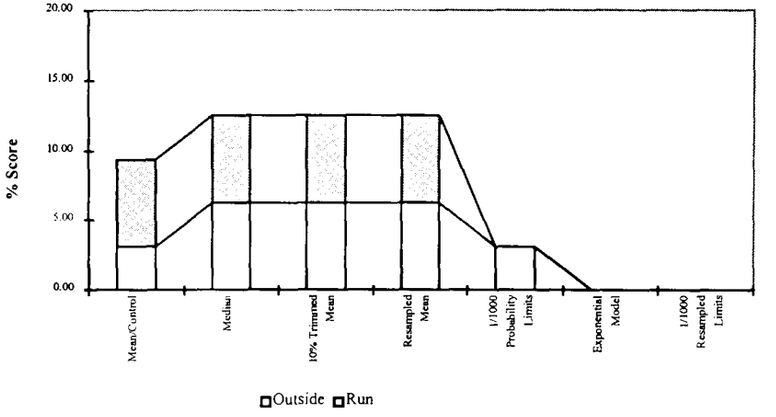
Bakery BU - Creation Projects



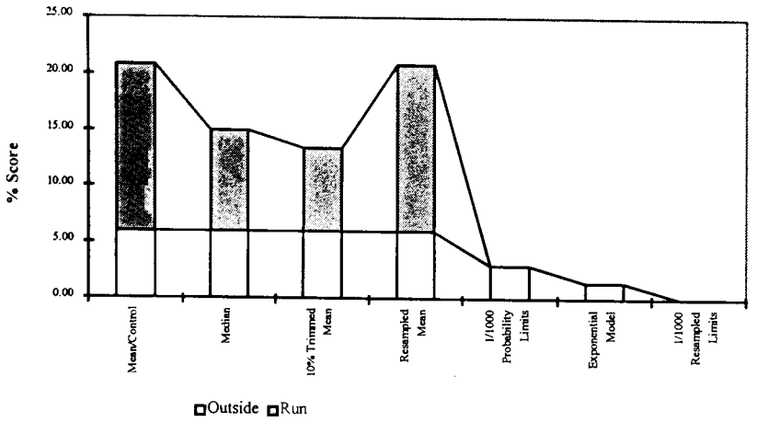
Bakery BU - Application Projects



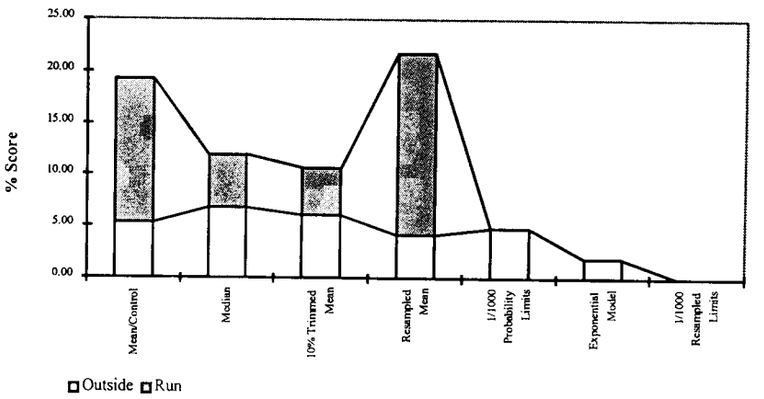
Bakery BU - Proactive Projects



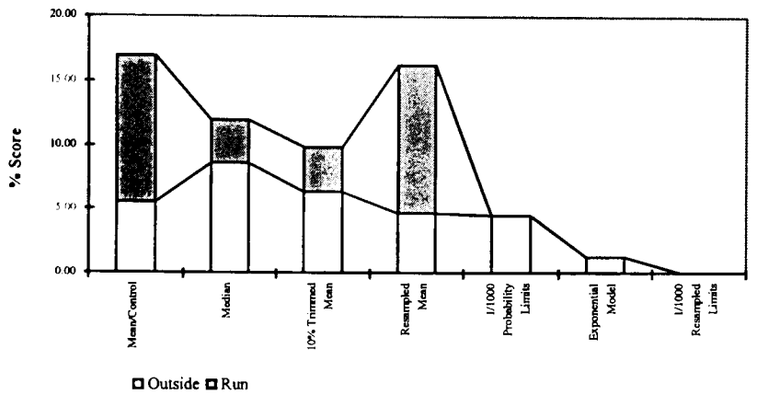
Bakery BU - Solicited Projects



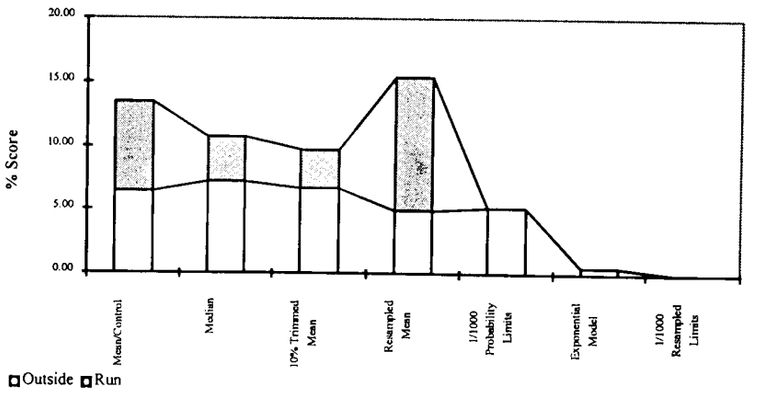
Beverage BU - Application Projects



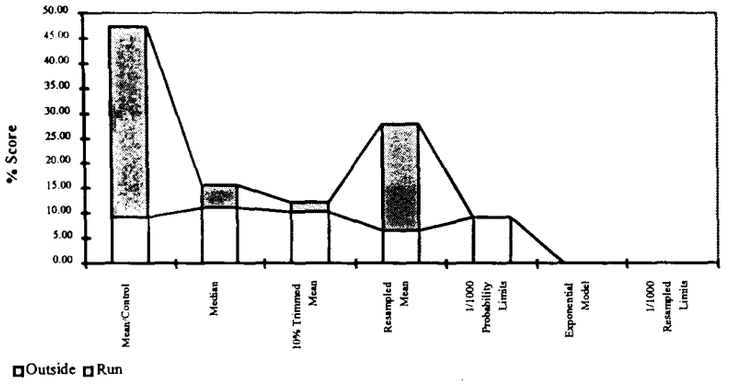
Beverage BU - All Projects



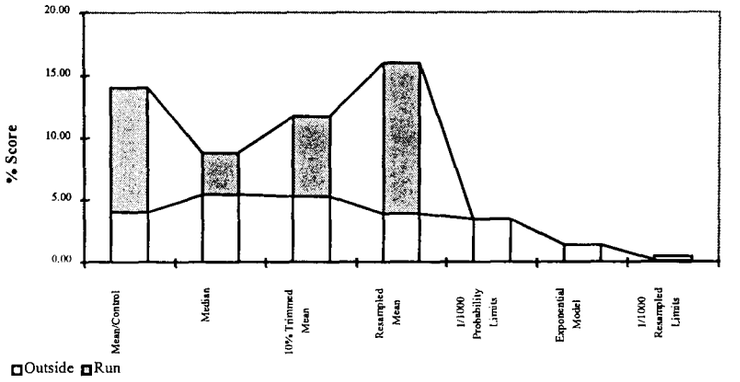
Beverage BU - Creation Projects



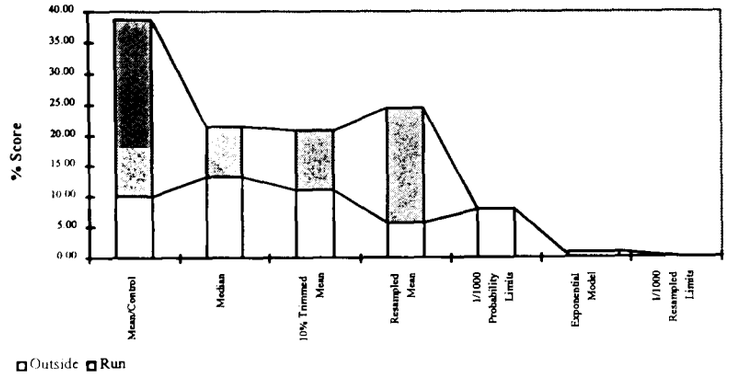
Beverage BU - Collection Projects



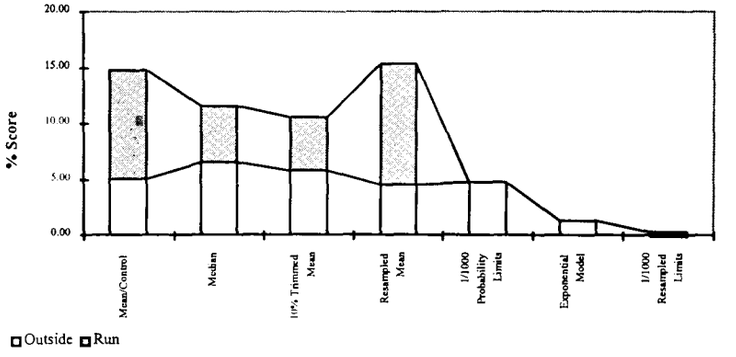
Beverage BU - Solicited Projects



Beverage BU - Proactive Projects



Confectionery BU - All Projects



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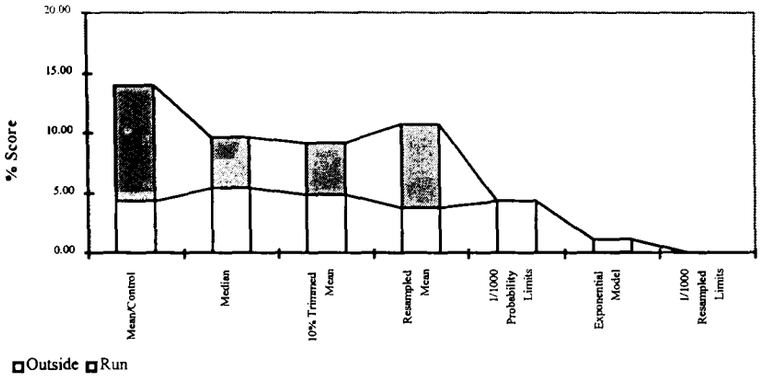
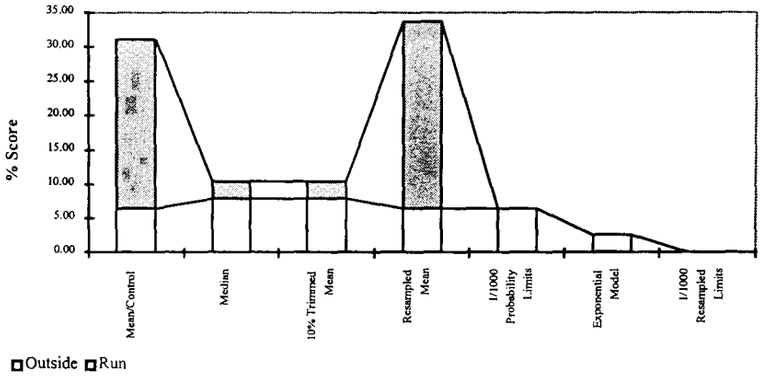
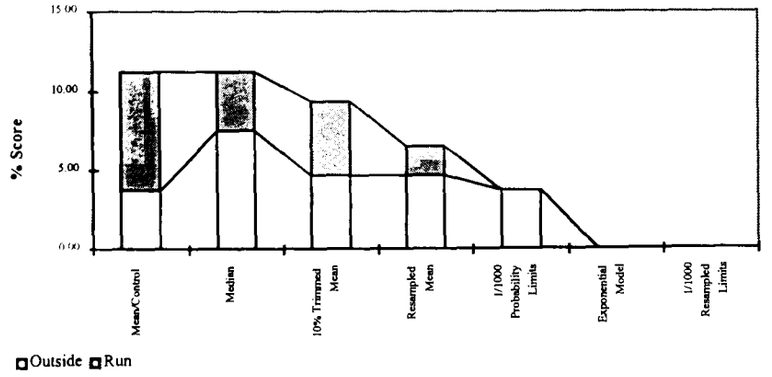


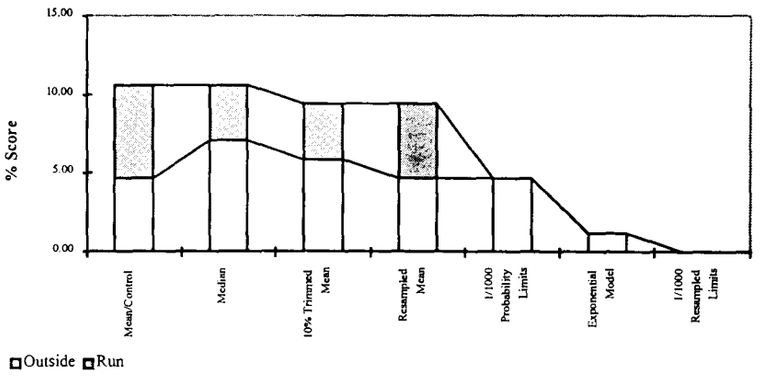
Confectionery BU - Collection Projects



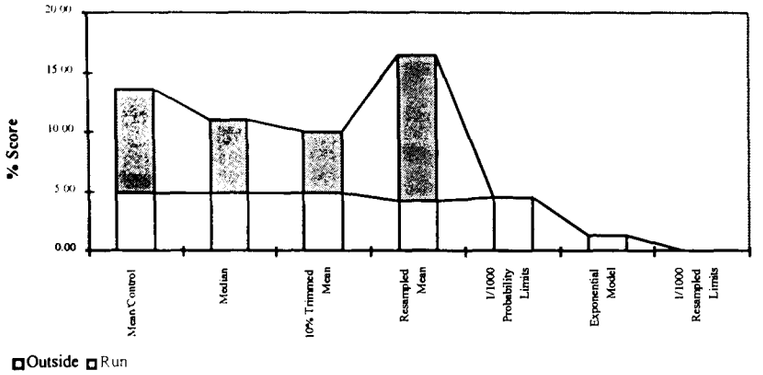
Confectionery BU - Creation Projects



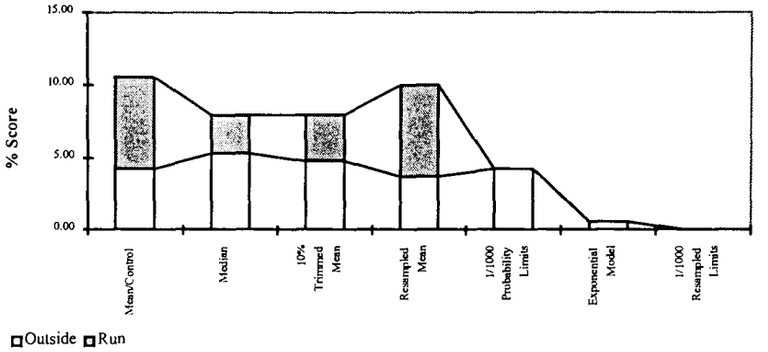
Confectionery BU - Proactive Projects



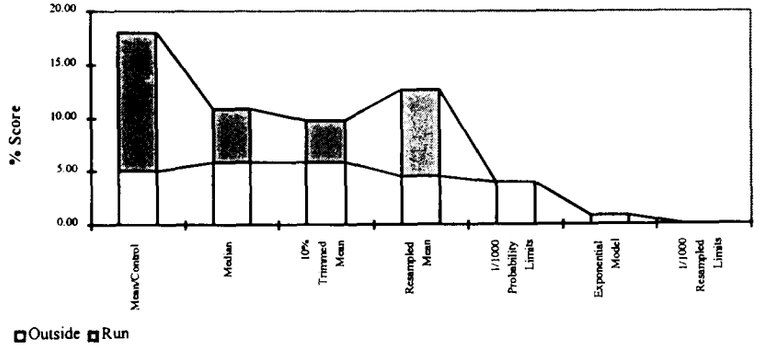
Confectionery BU - Solicited Projects



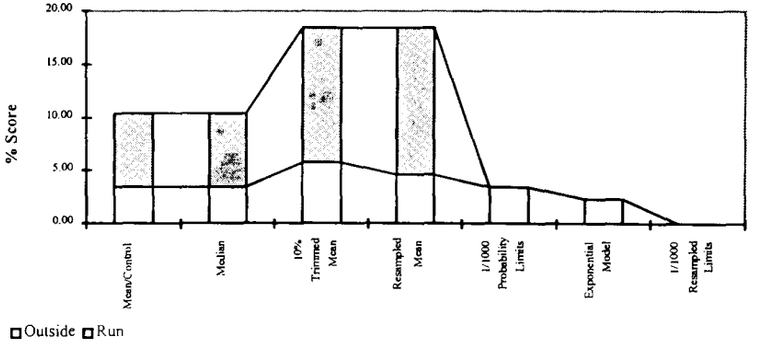
Dairy BU - Application Projects



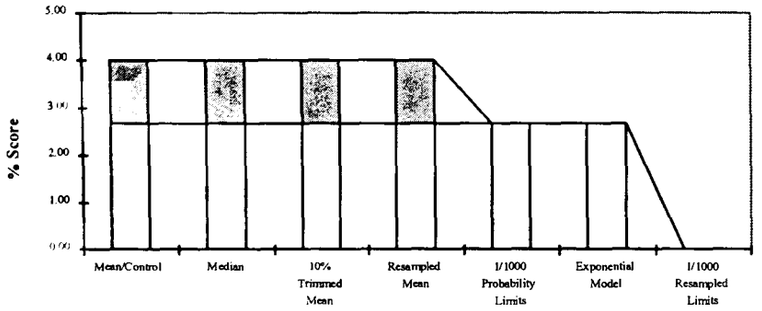
Dairy BU - All Projects



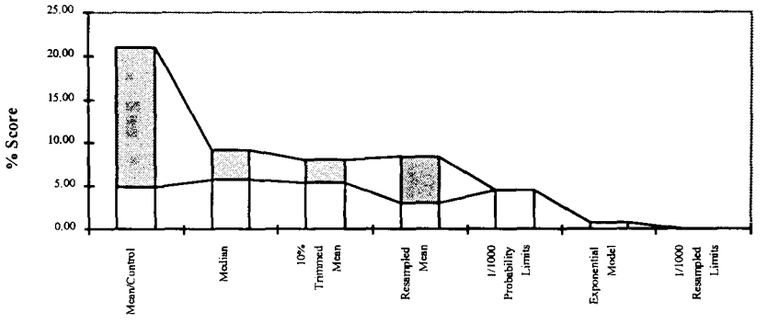
Dairy BU - Creation Projects



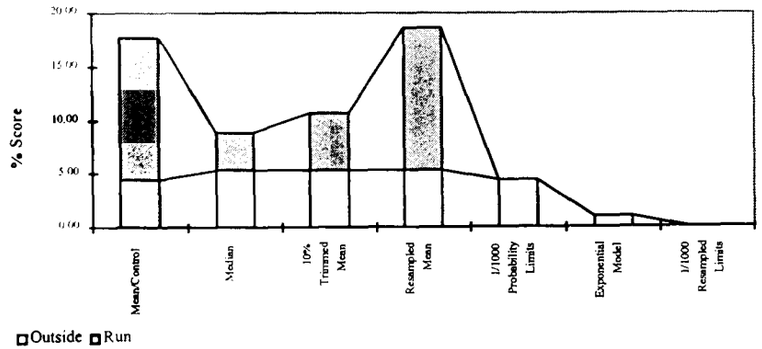
Dairy BU - Collection Projects



Dairy BU - Solicited Projects



Dairy BU - Proactive Projects

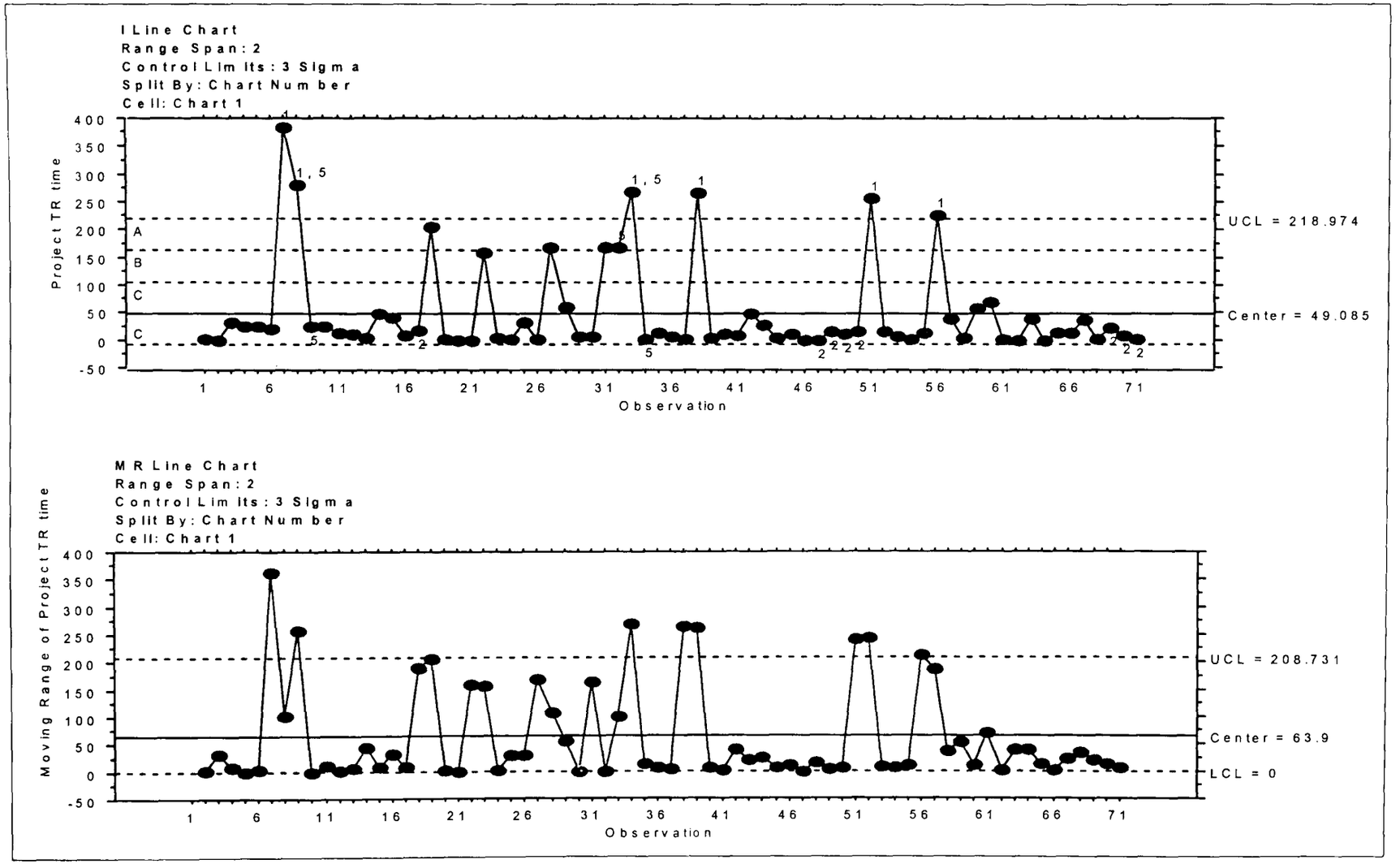


Appendix 9

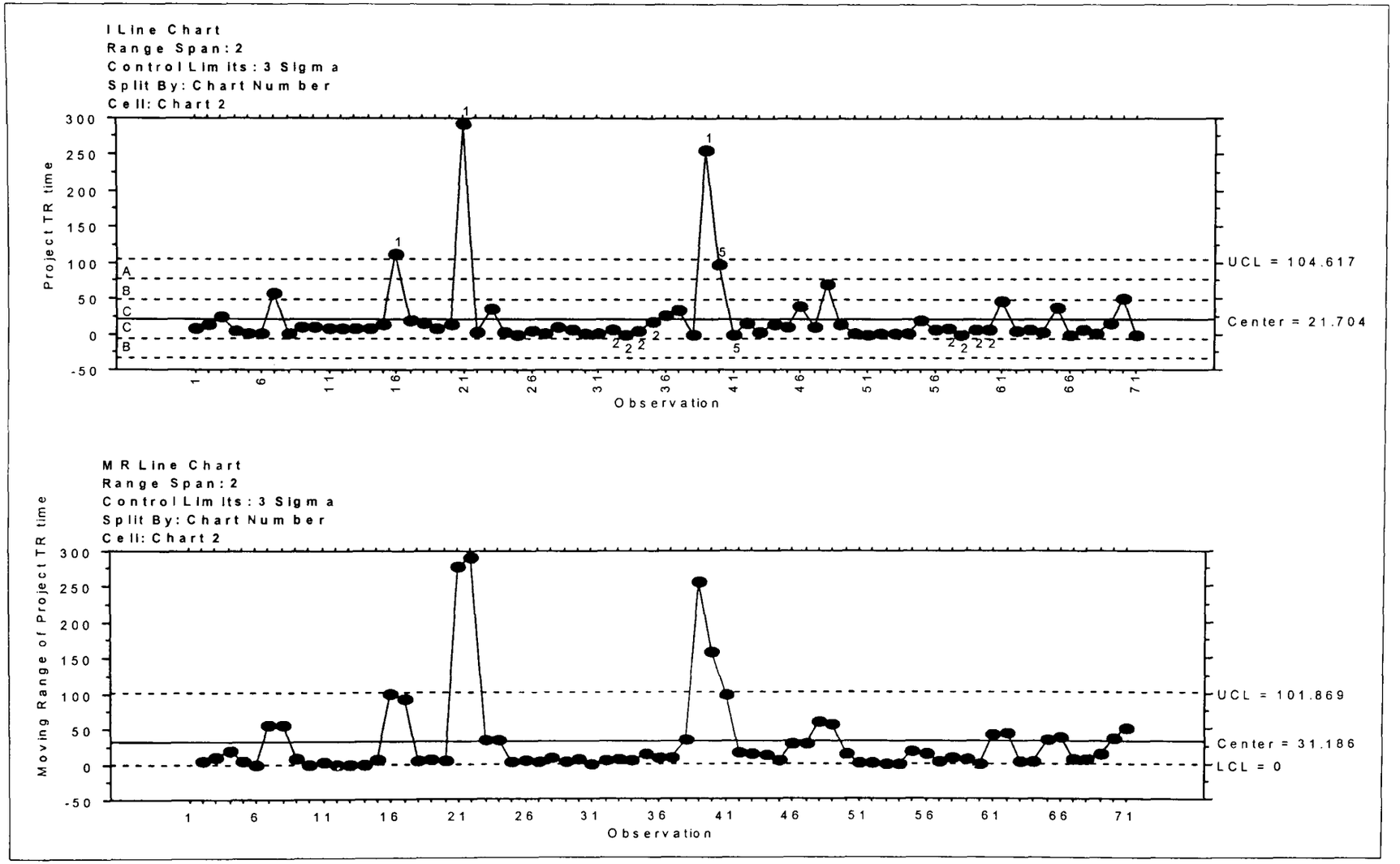
Control Charts for the Default Method / Mean

Beverage BU

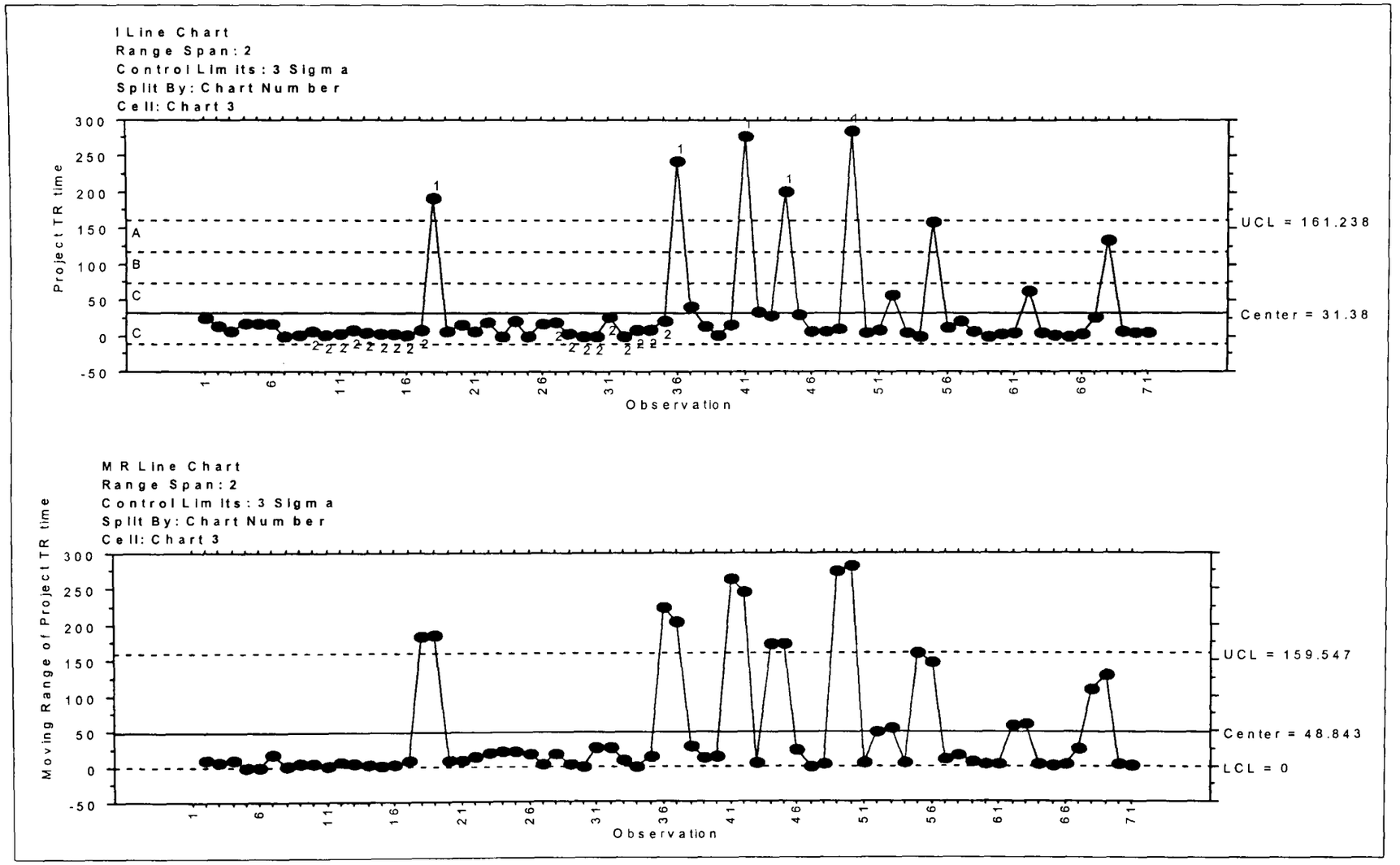
Beverage BU - All Projects



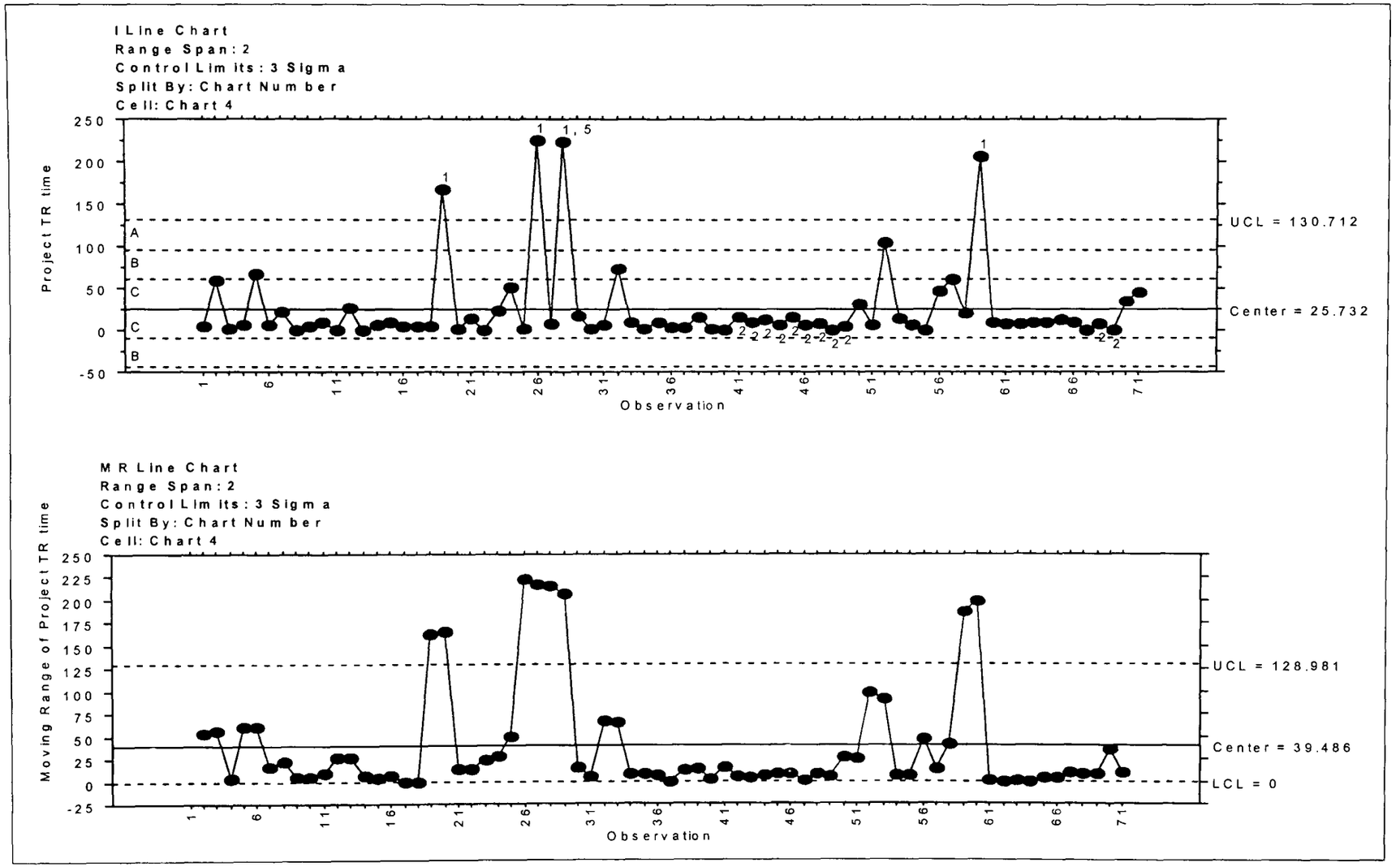
Beverage BU - All Projects



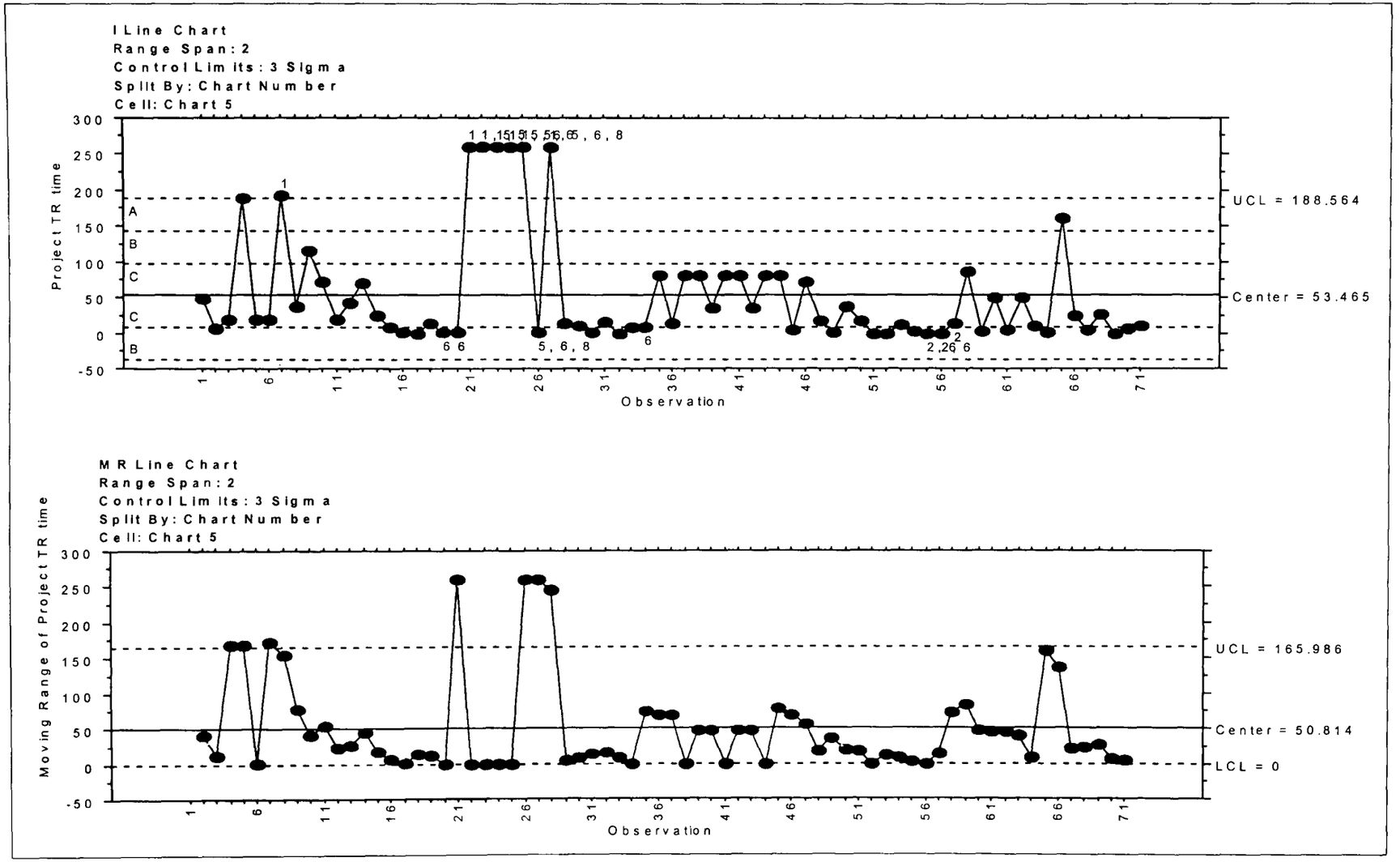
Beverage BU - All Projects



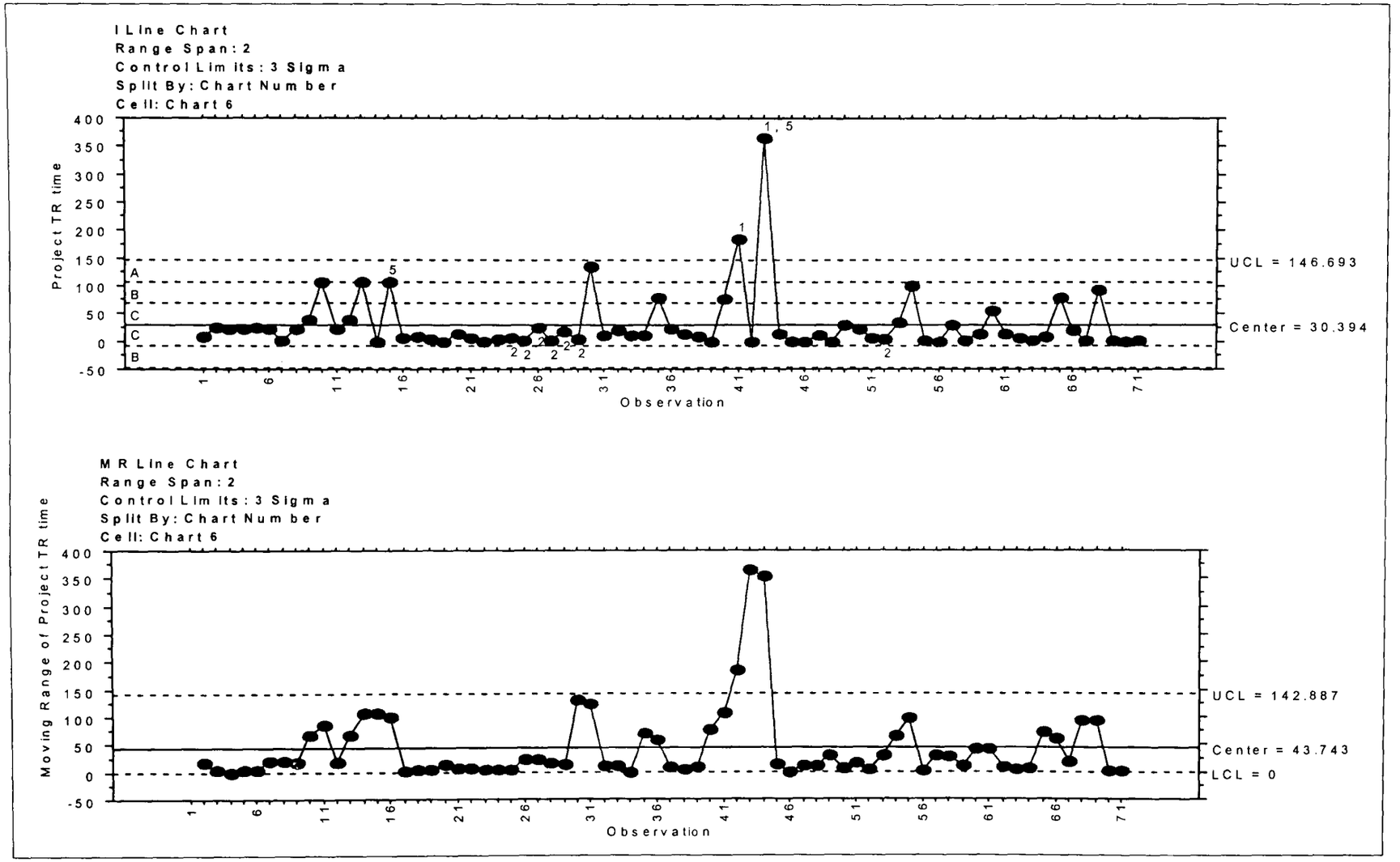
Beverage BU - All Projects



Beverage BU - All Projects



Beverage BU - All Projects



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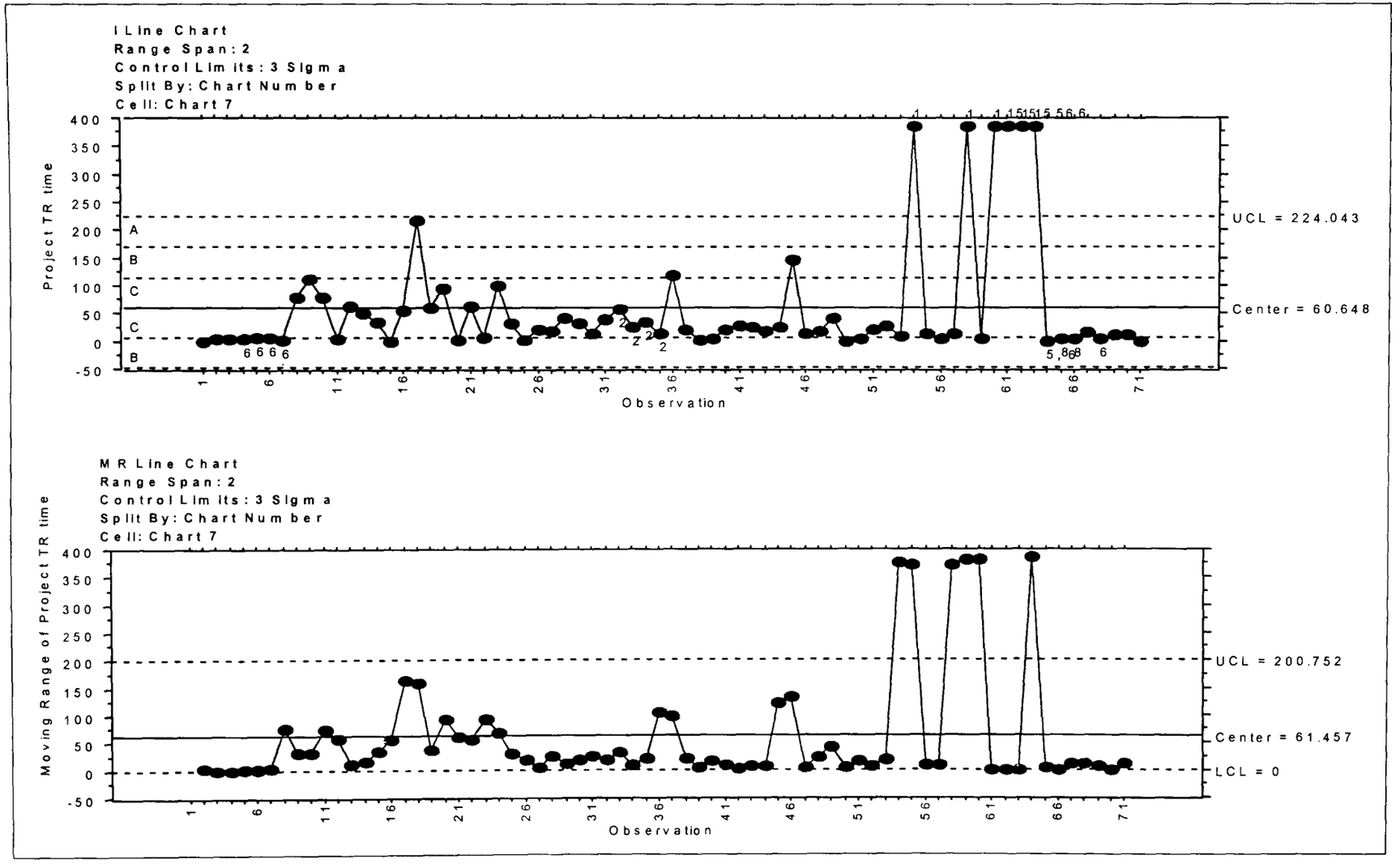

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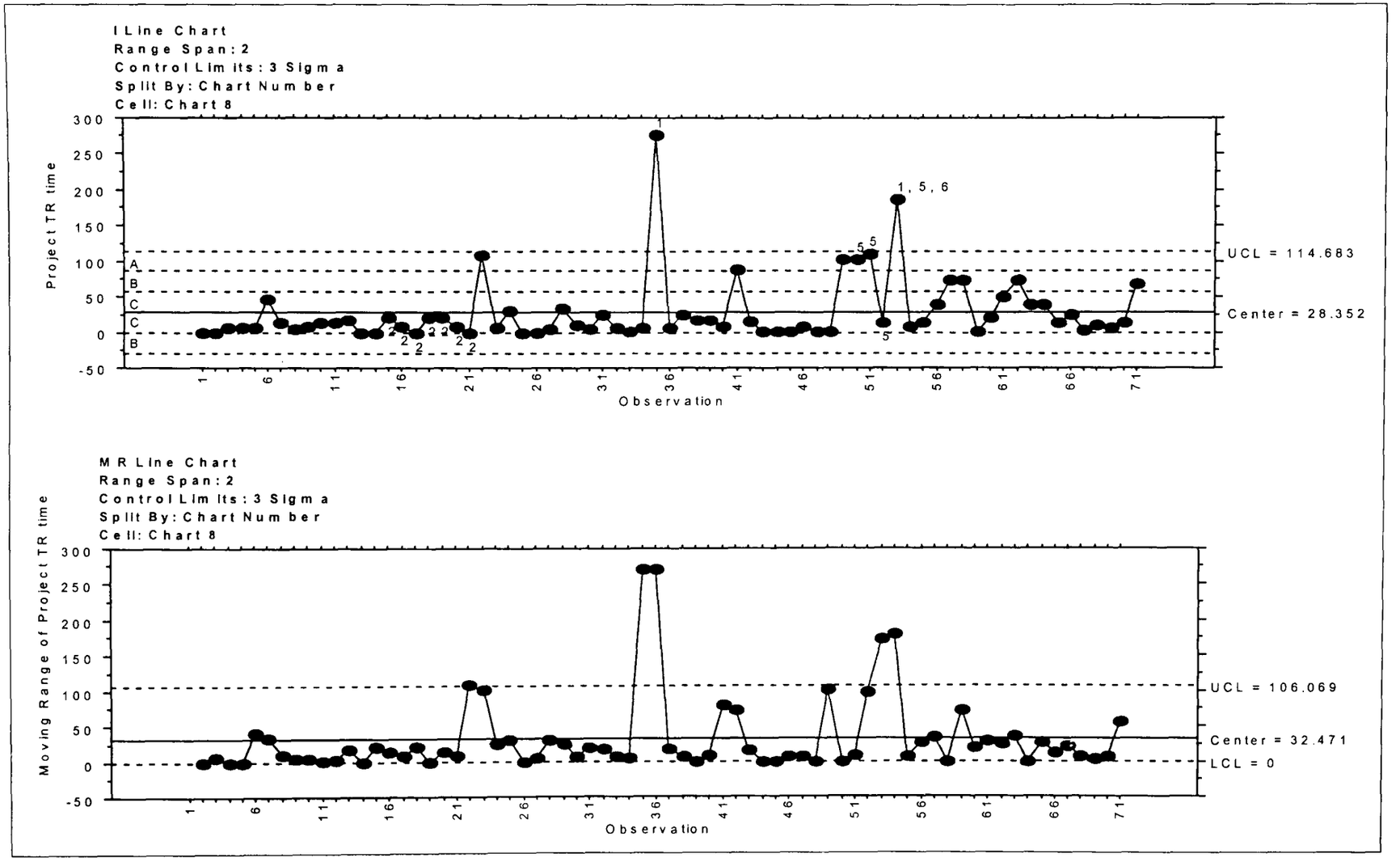

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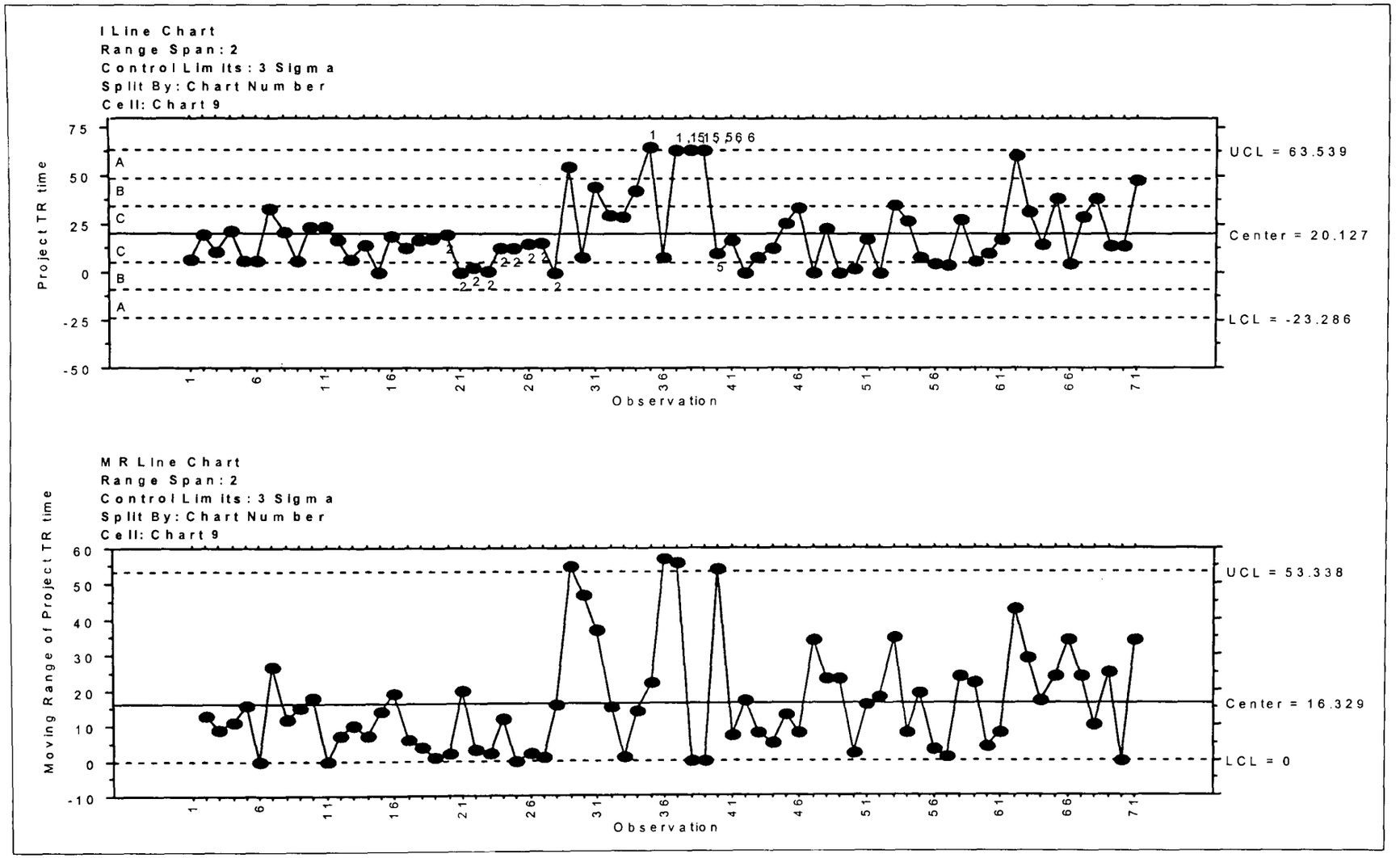

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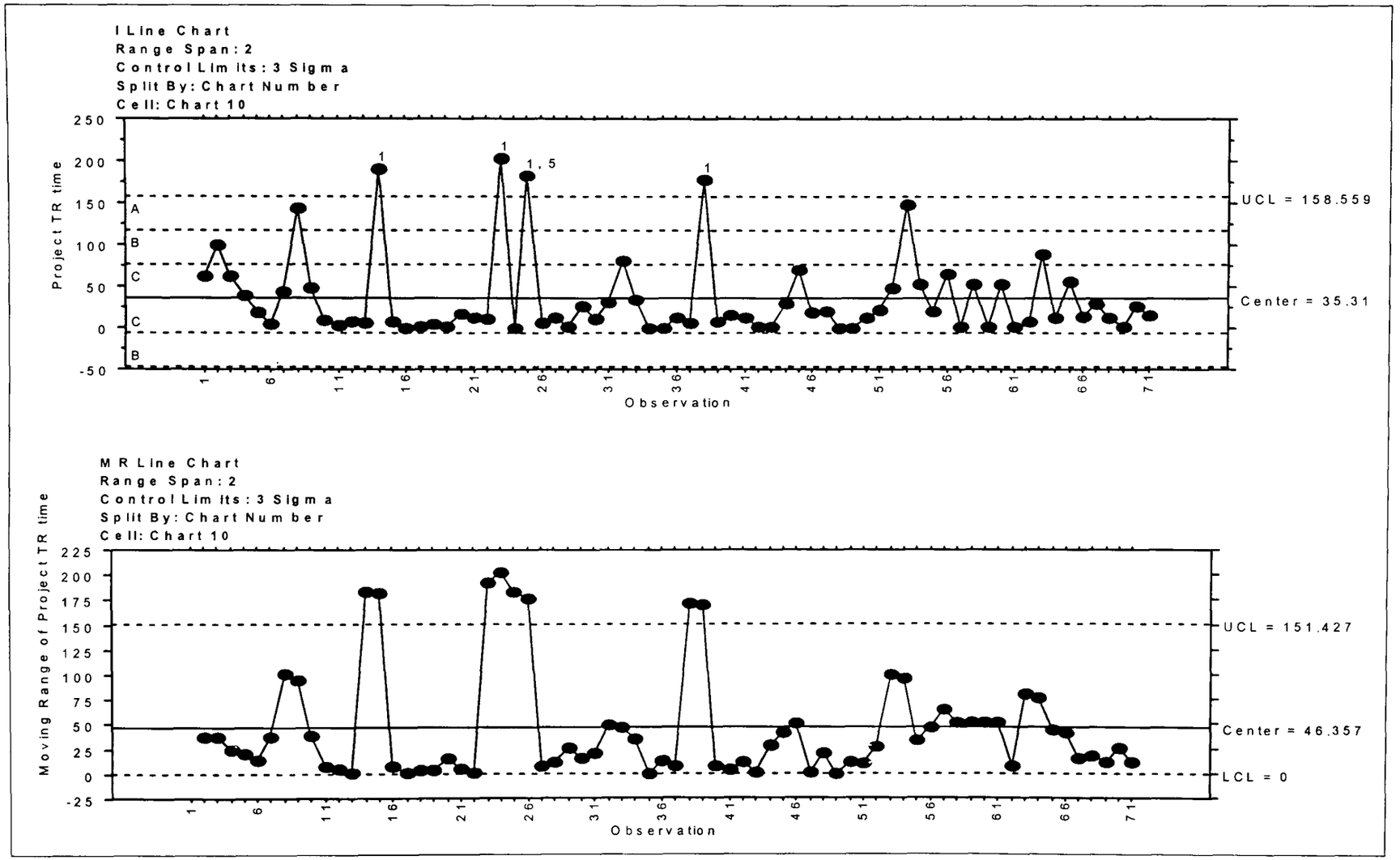

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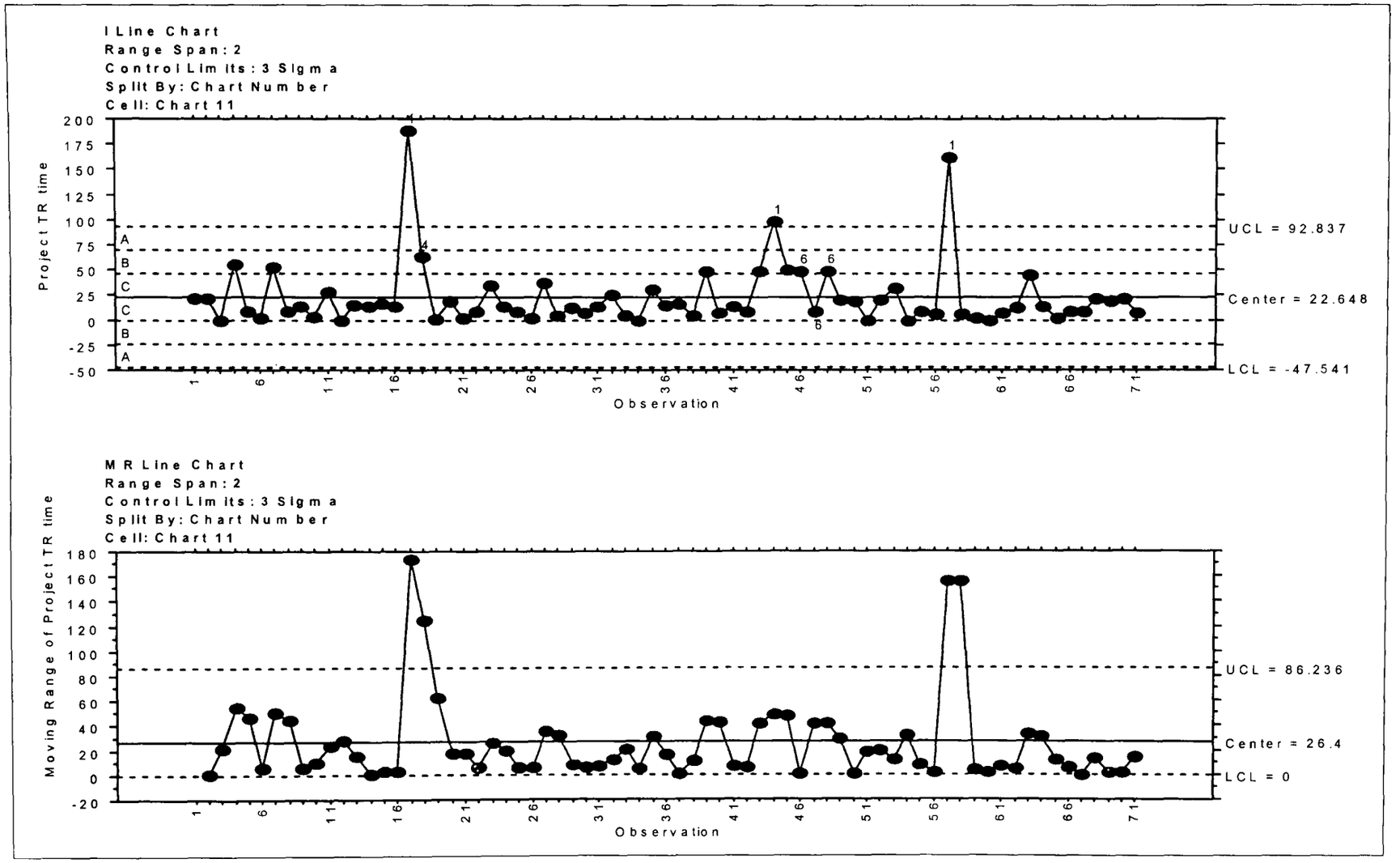

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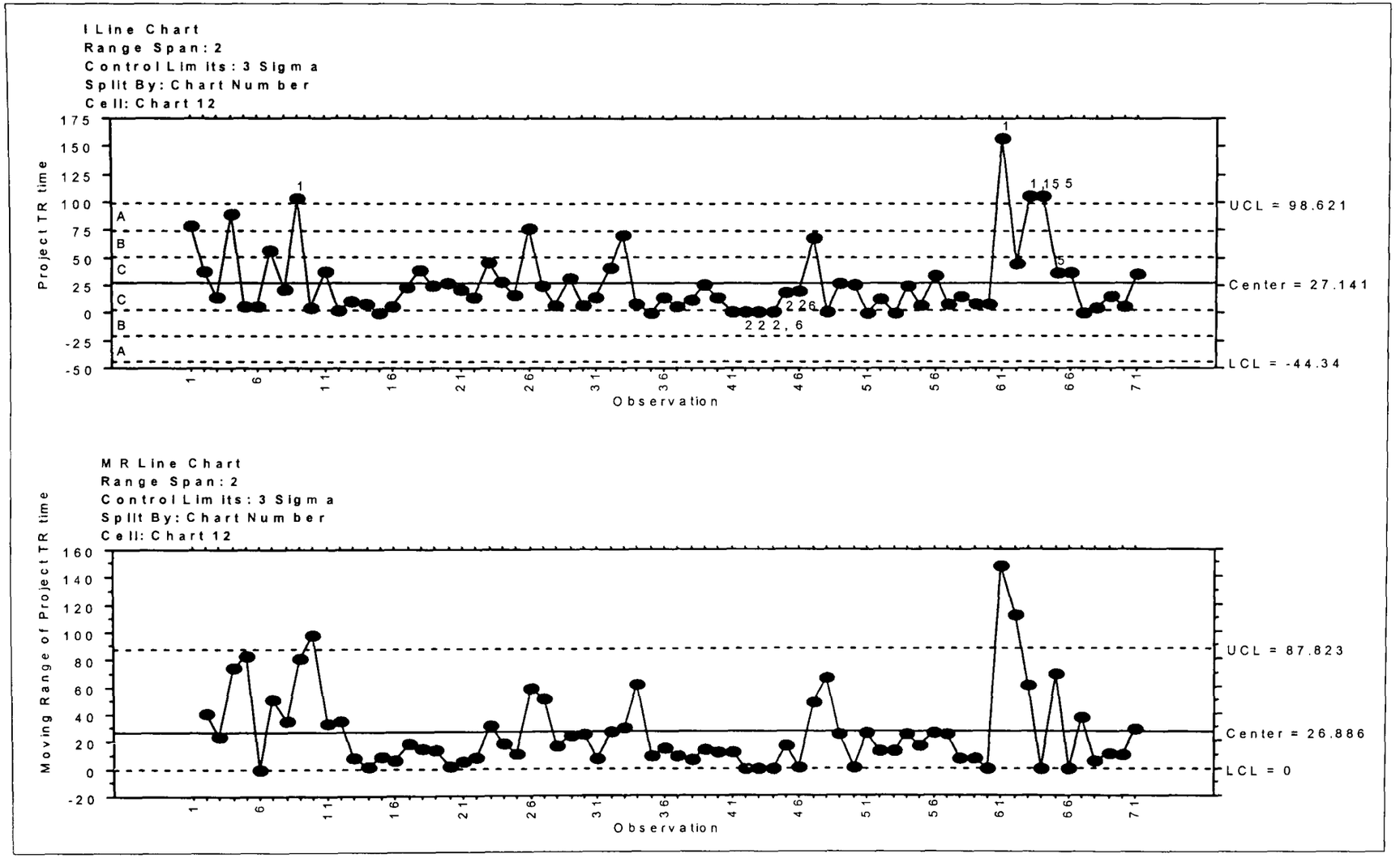
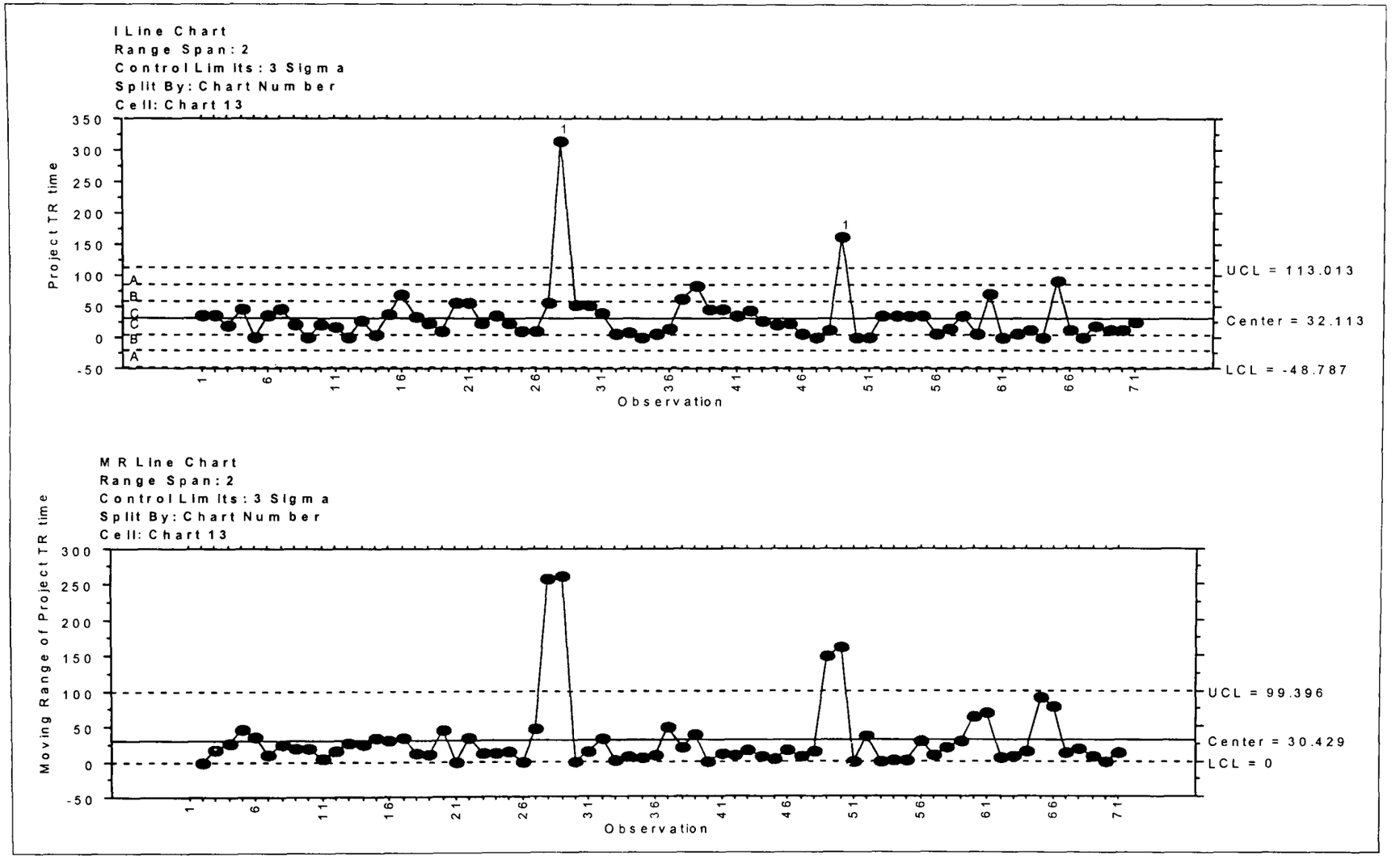


Beverage BU - All Projects



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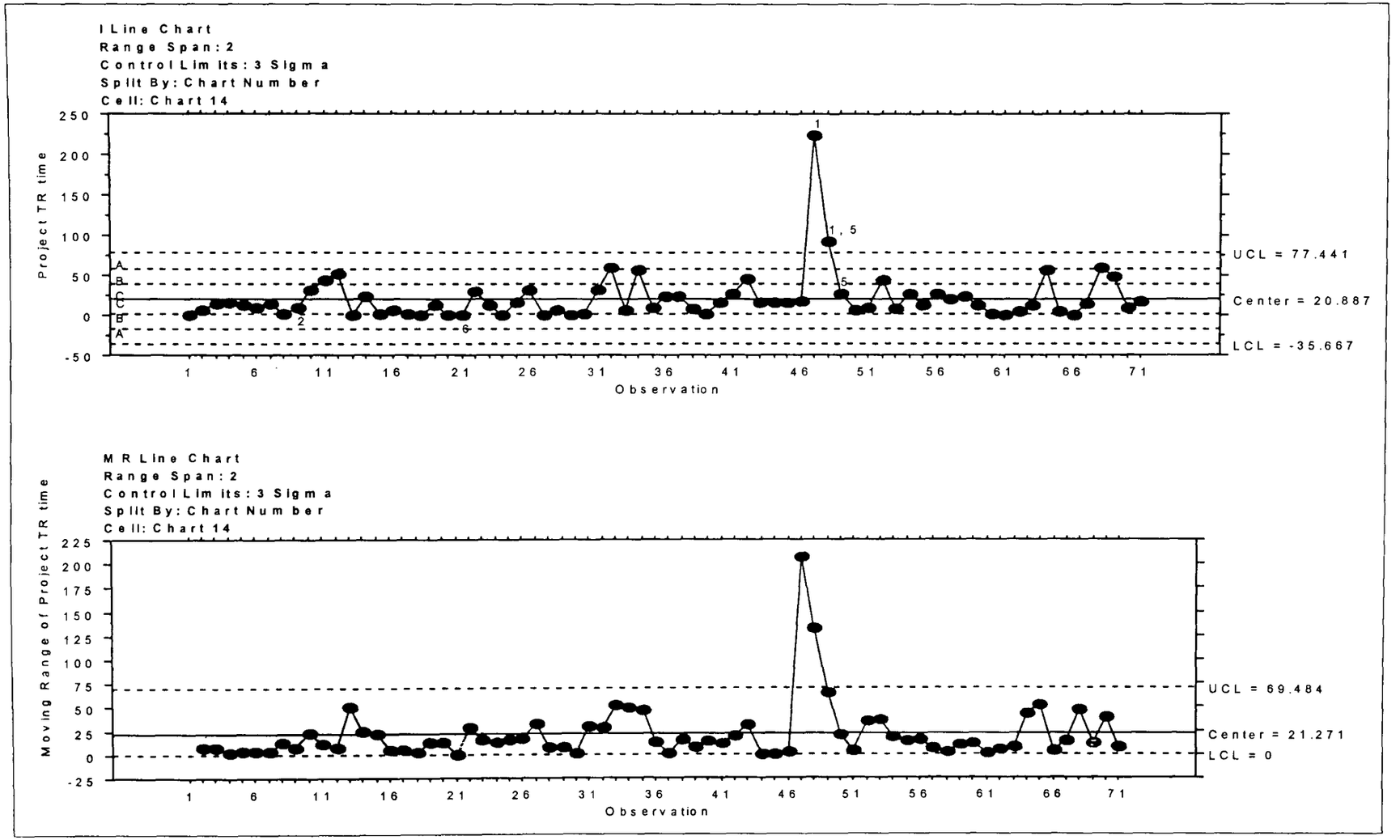
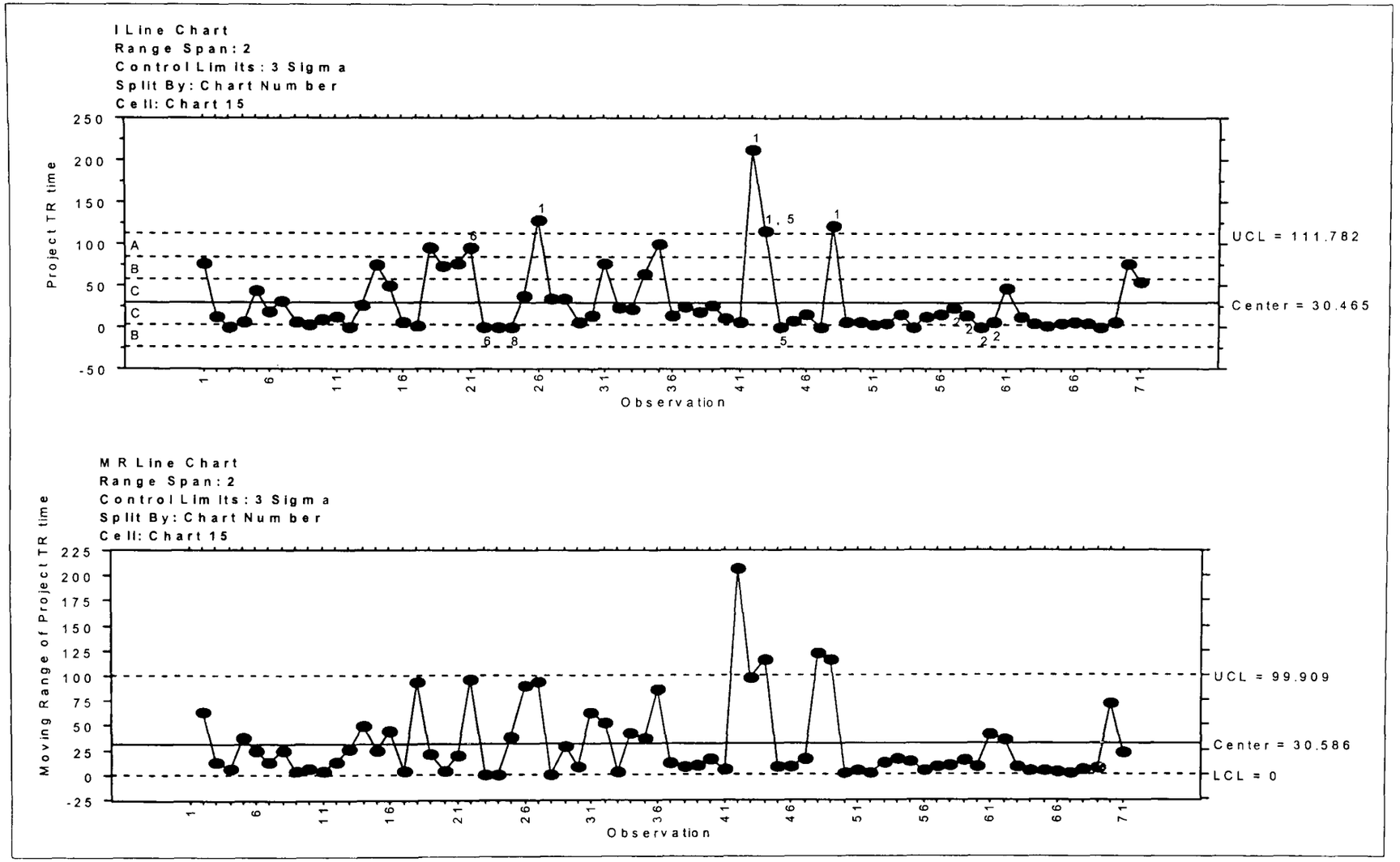
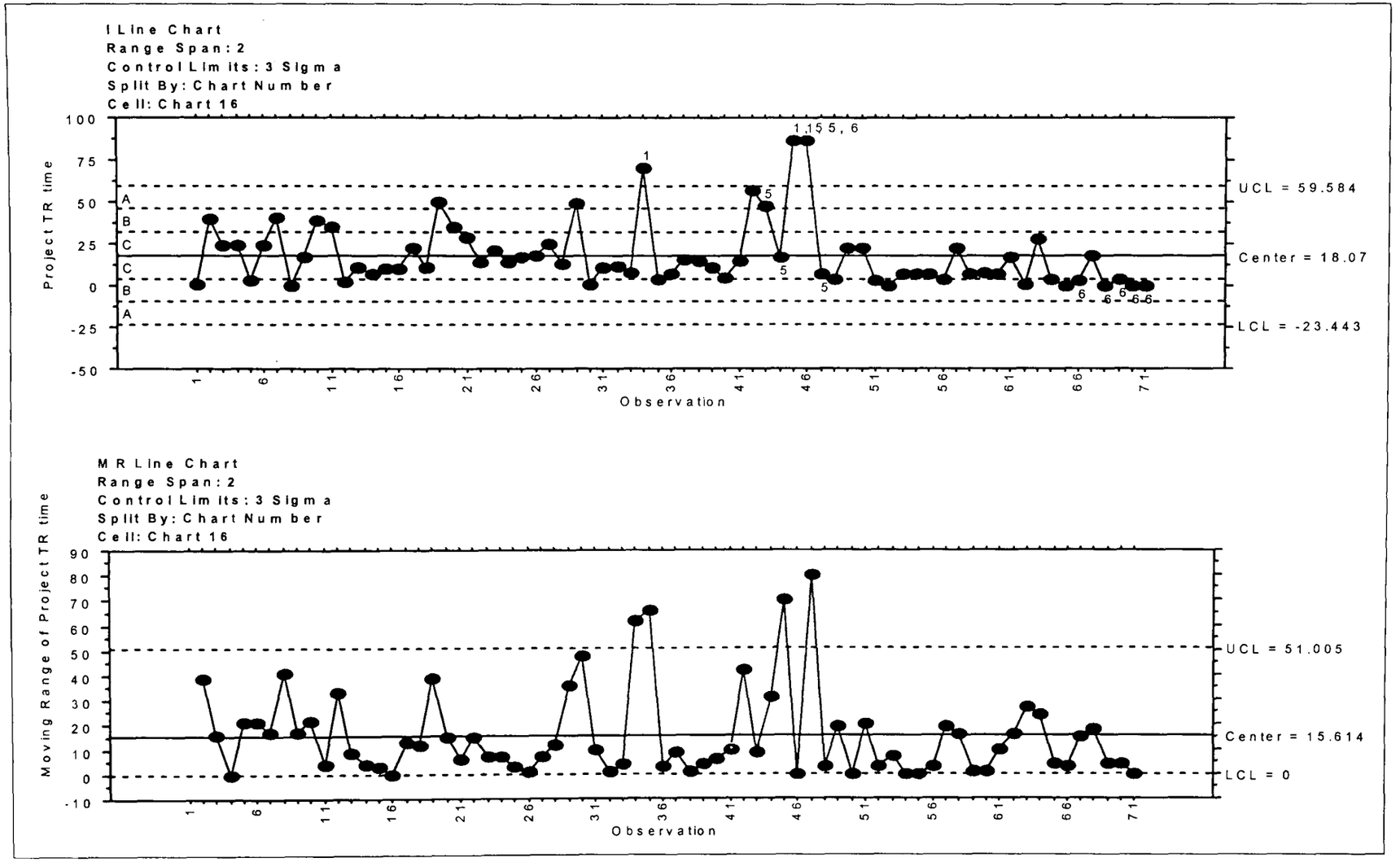


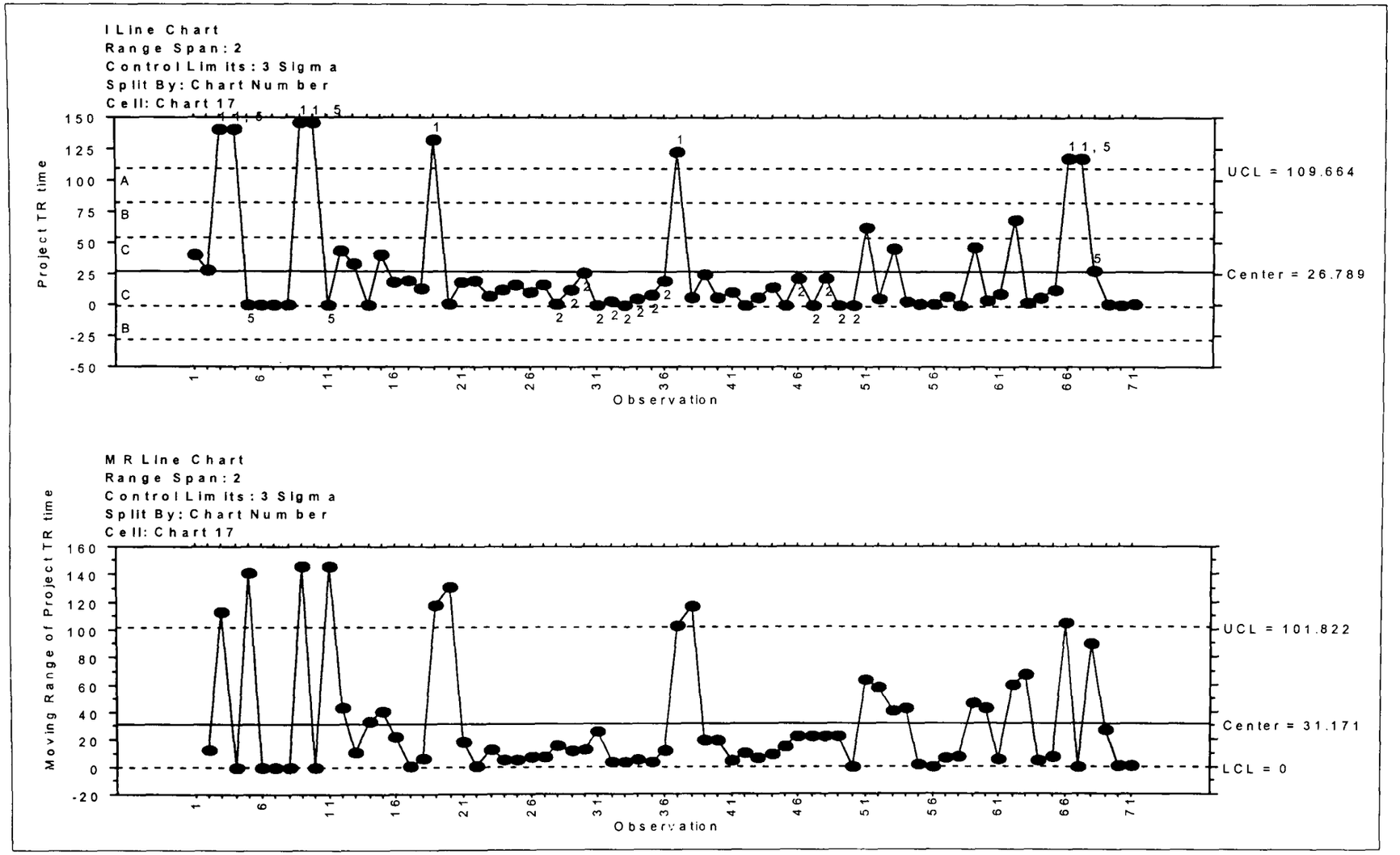
Beverage BU - All Projects



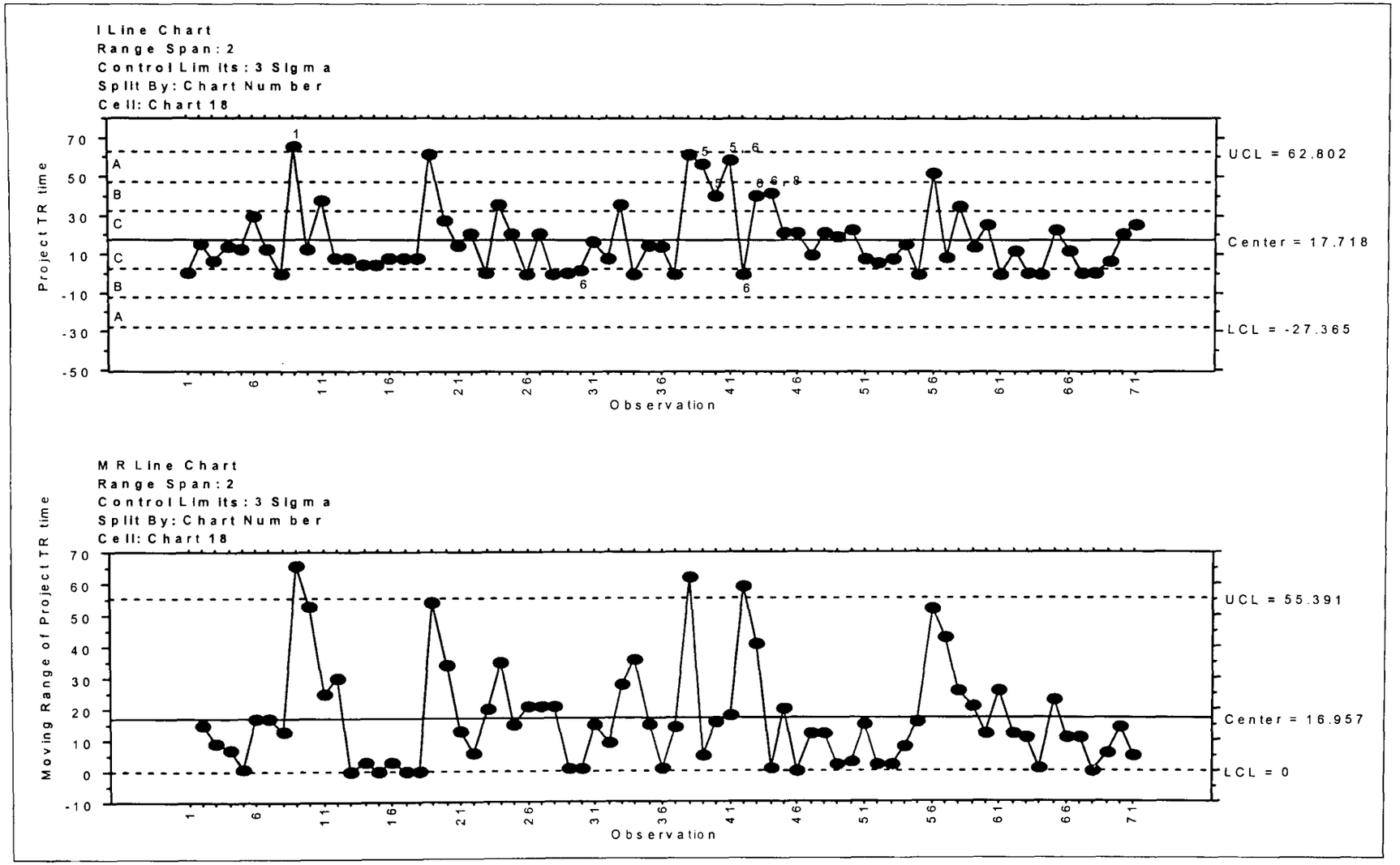
Beverage BU - All Projects



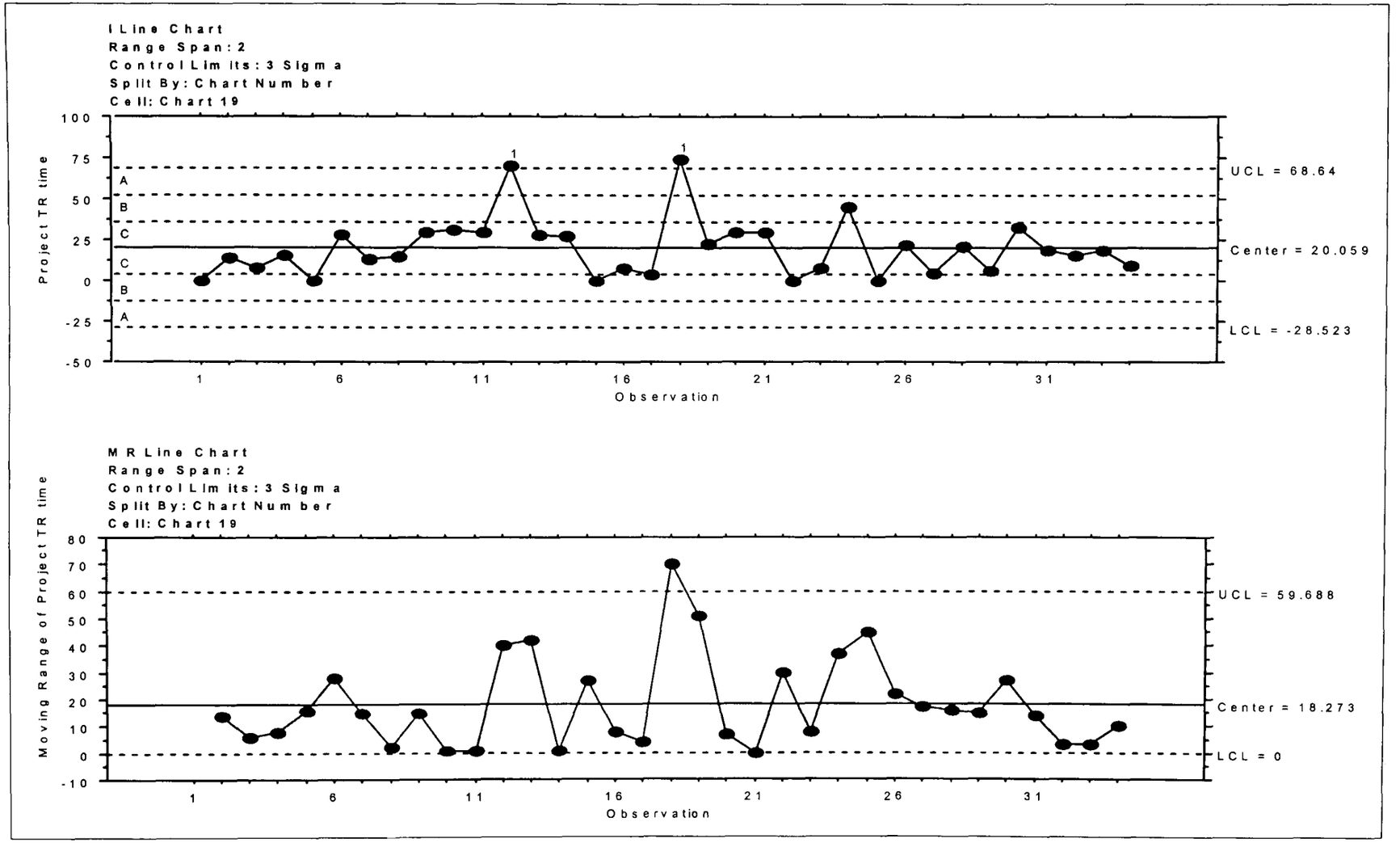
Beverage BU - All Projects

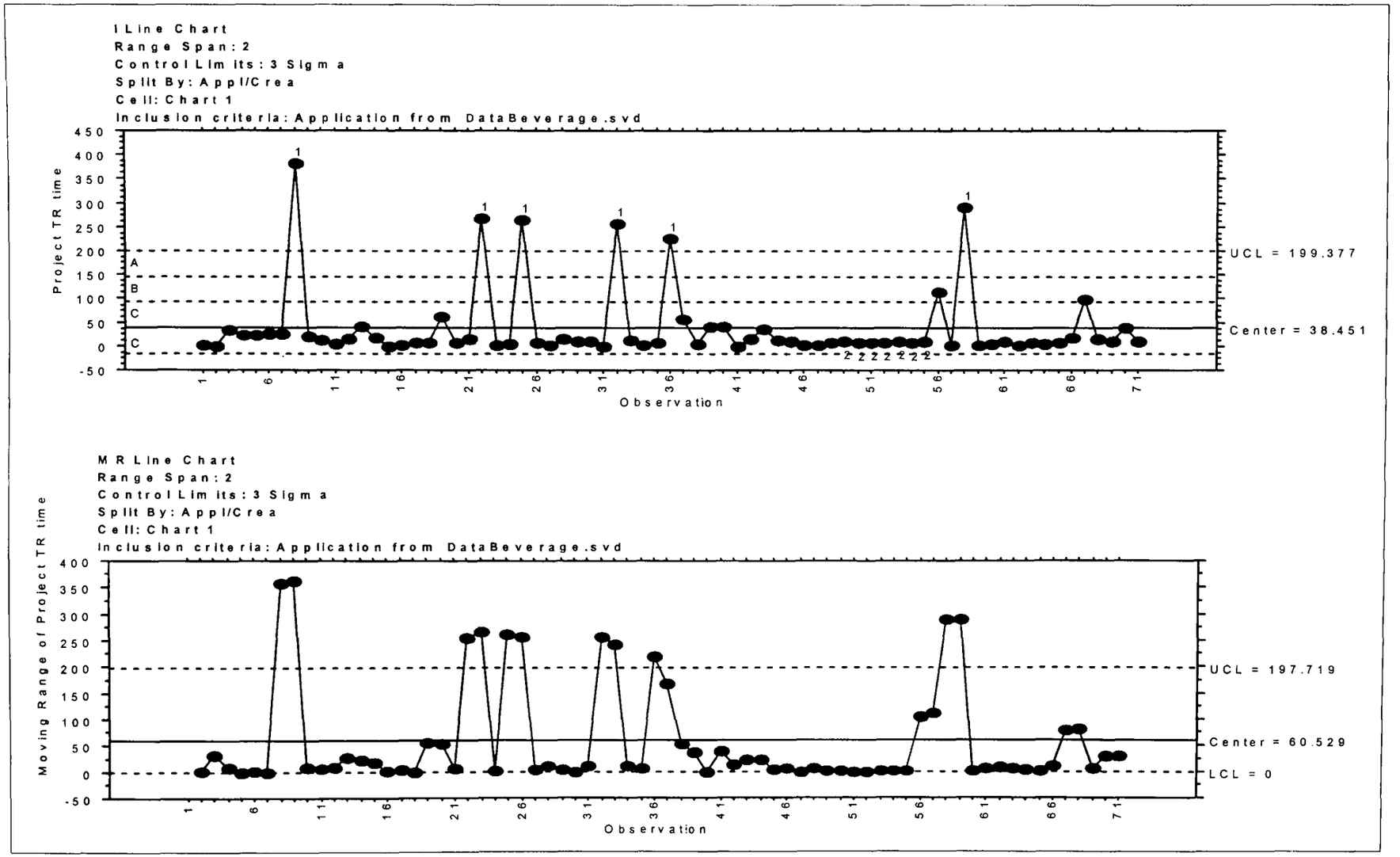


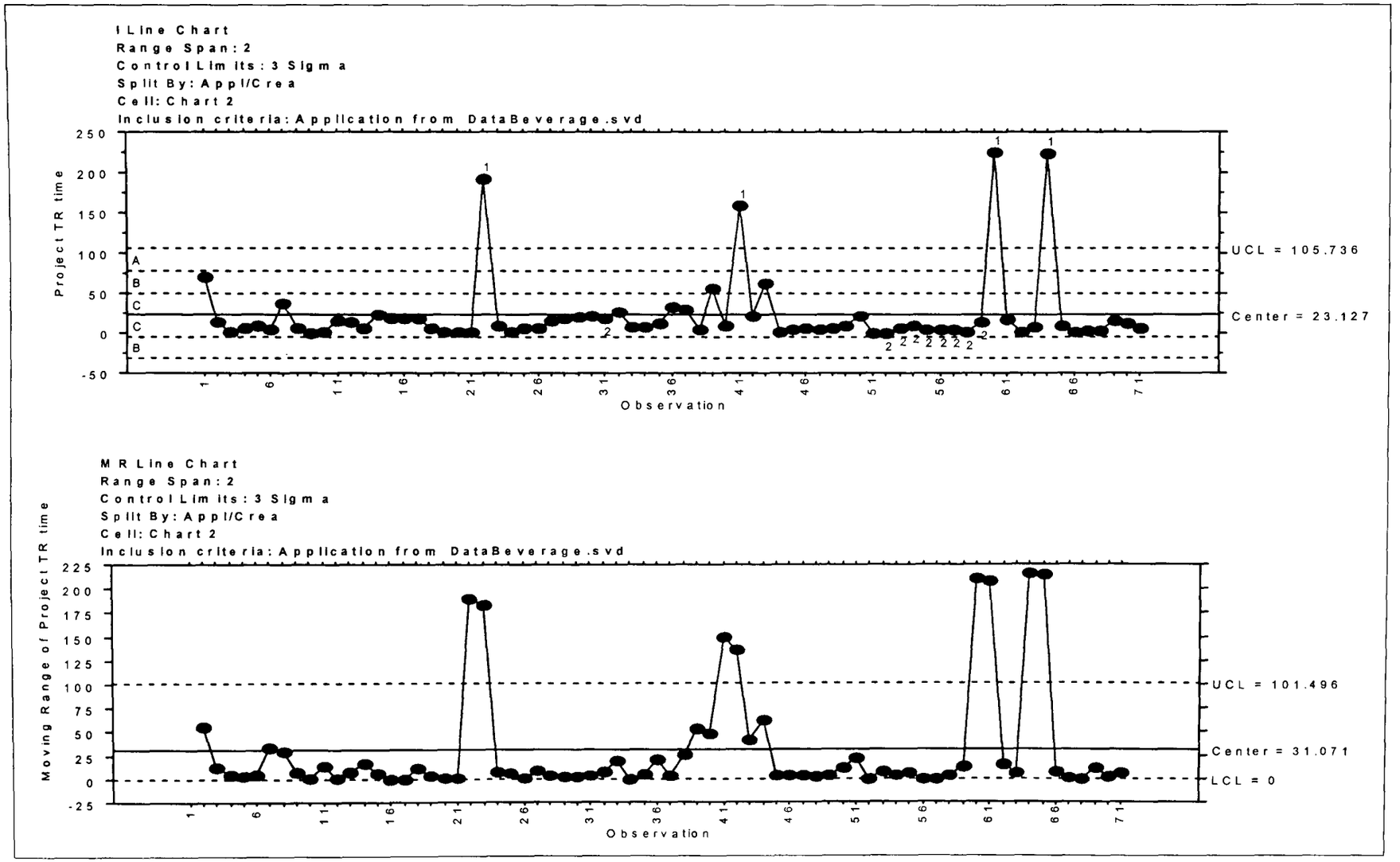
Beverage BU - All Projects

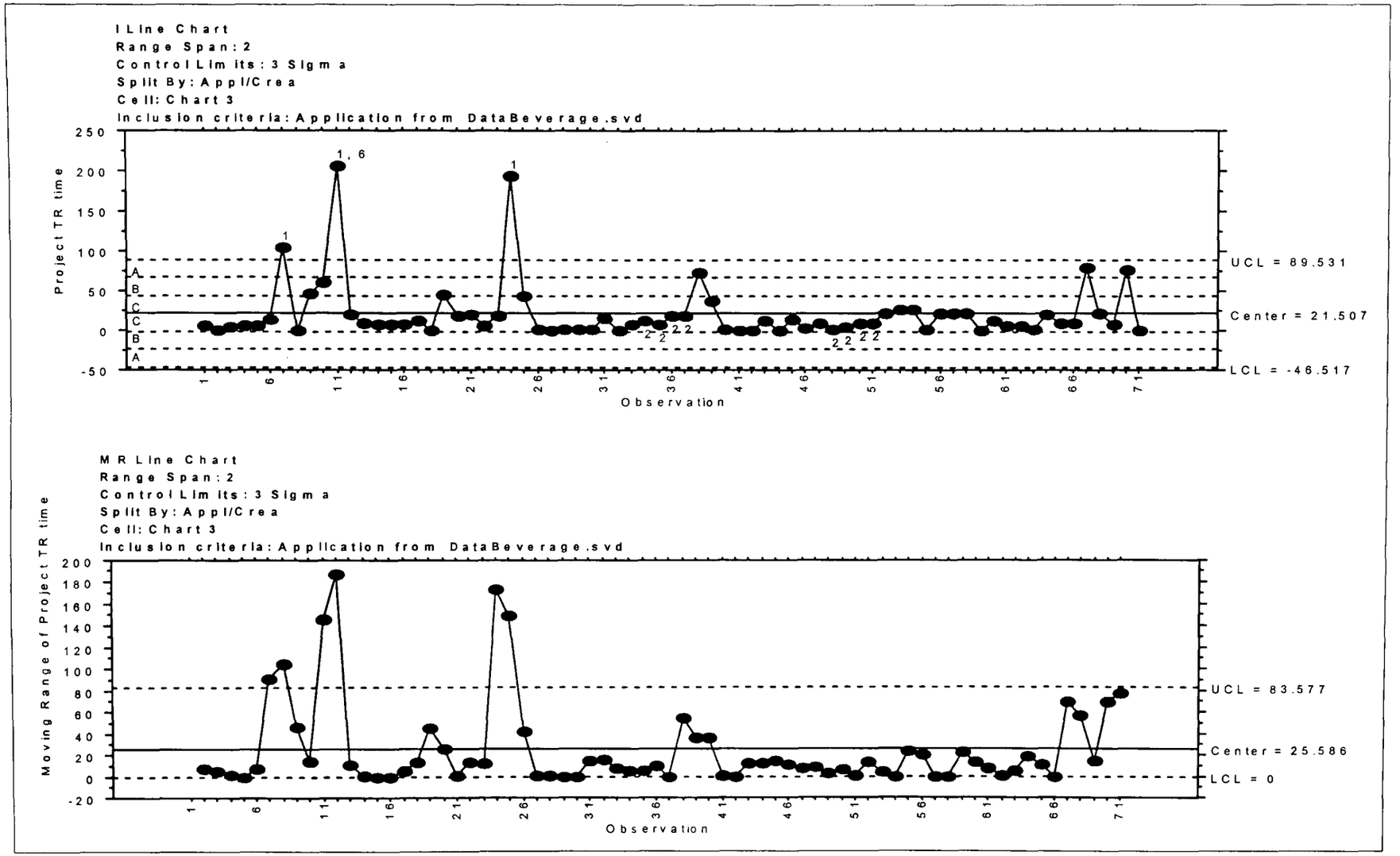


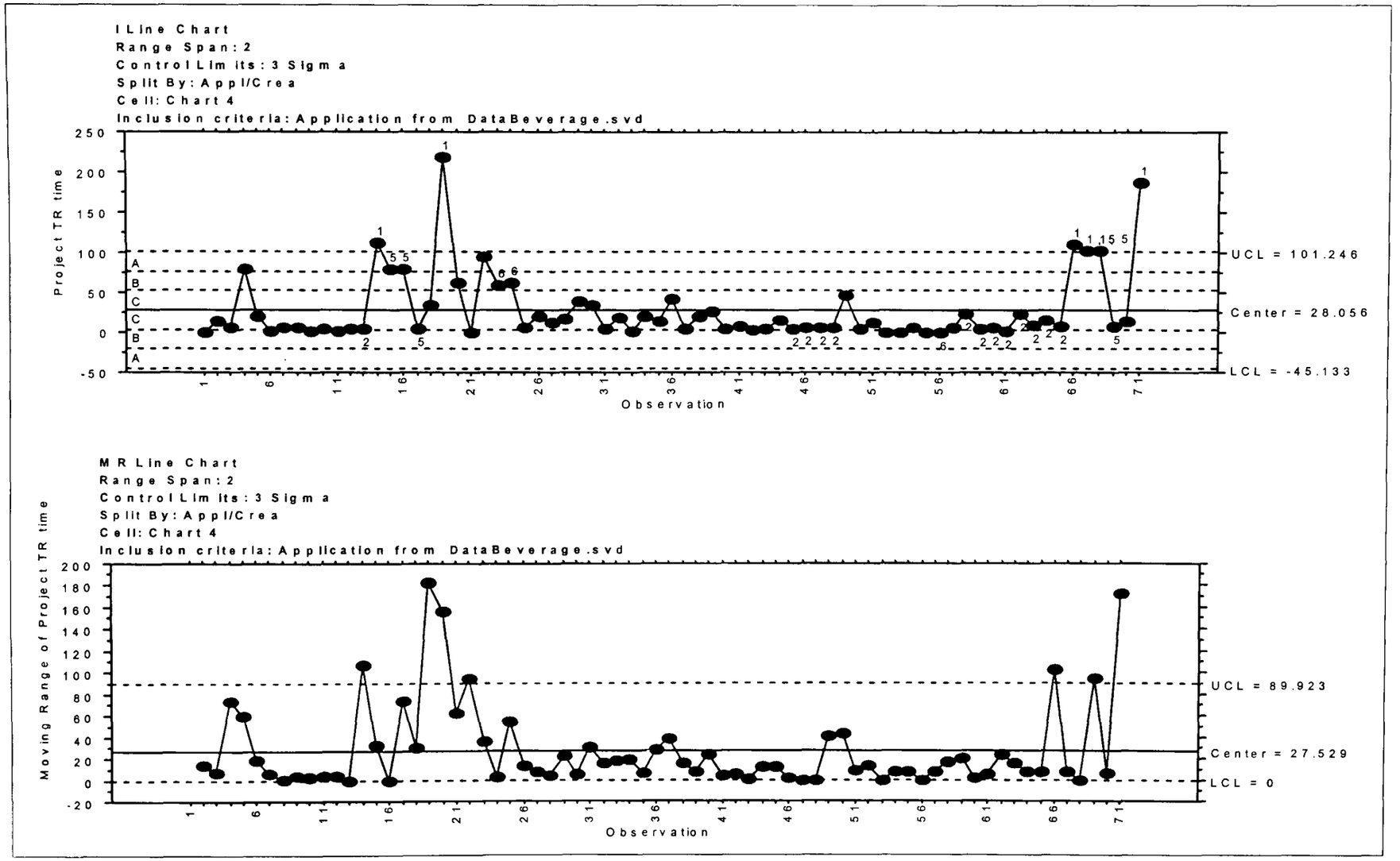
Beverage BU - All Projects

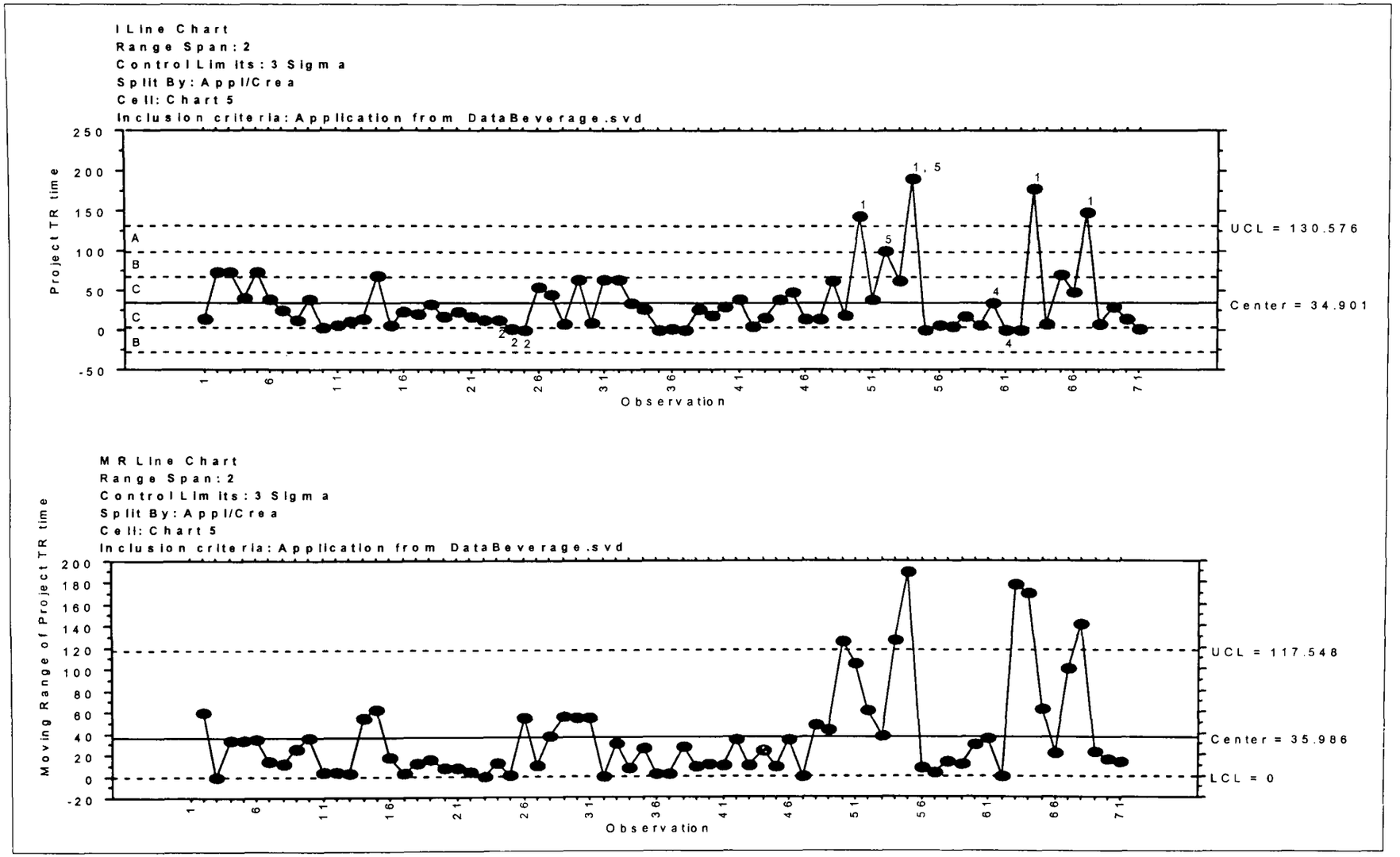


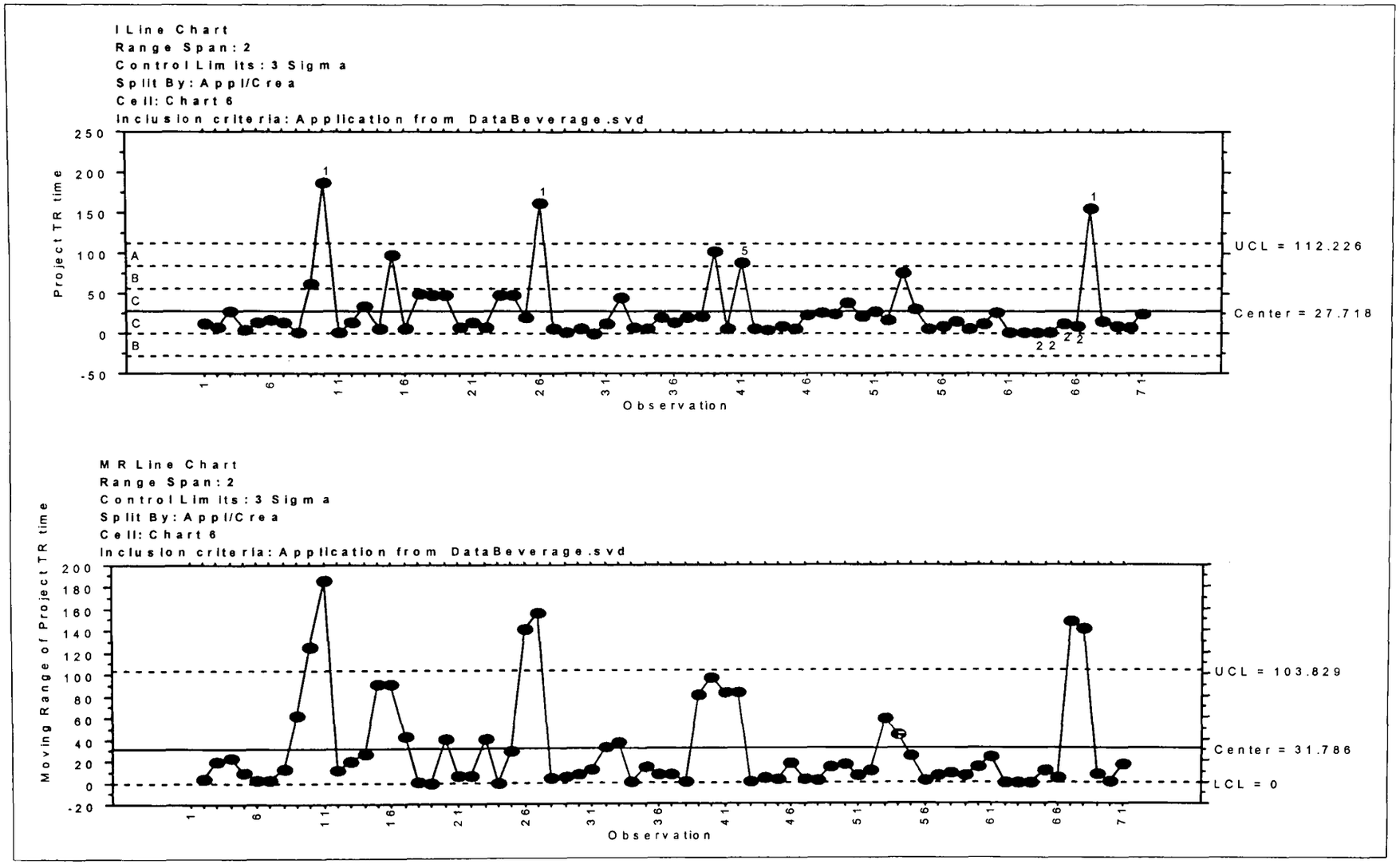

I Line Chart
Range Span: 2
Control Limits: 3 Sigma
Split By: Appl/Crea
Cell: Chart 1
Inclusion criteria: Application from DataBeverage.svd
Project TR time
Observation
UCL = 199.377
Center = 38.451
M R Line Chart
Range Span: 2
Control Limits: 3 Sigma
Split By: Appl/Crea
Cell: Chart 1
Inclusion criteria: Application from DataBeverage.svd
Moving Range of Project TR time
Observation
UCL = 197.719
Center = 60.529
LCL = 0

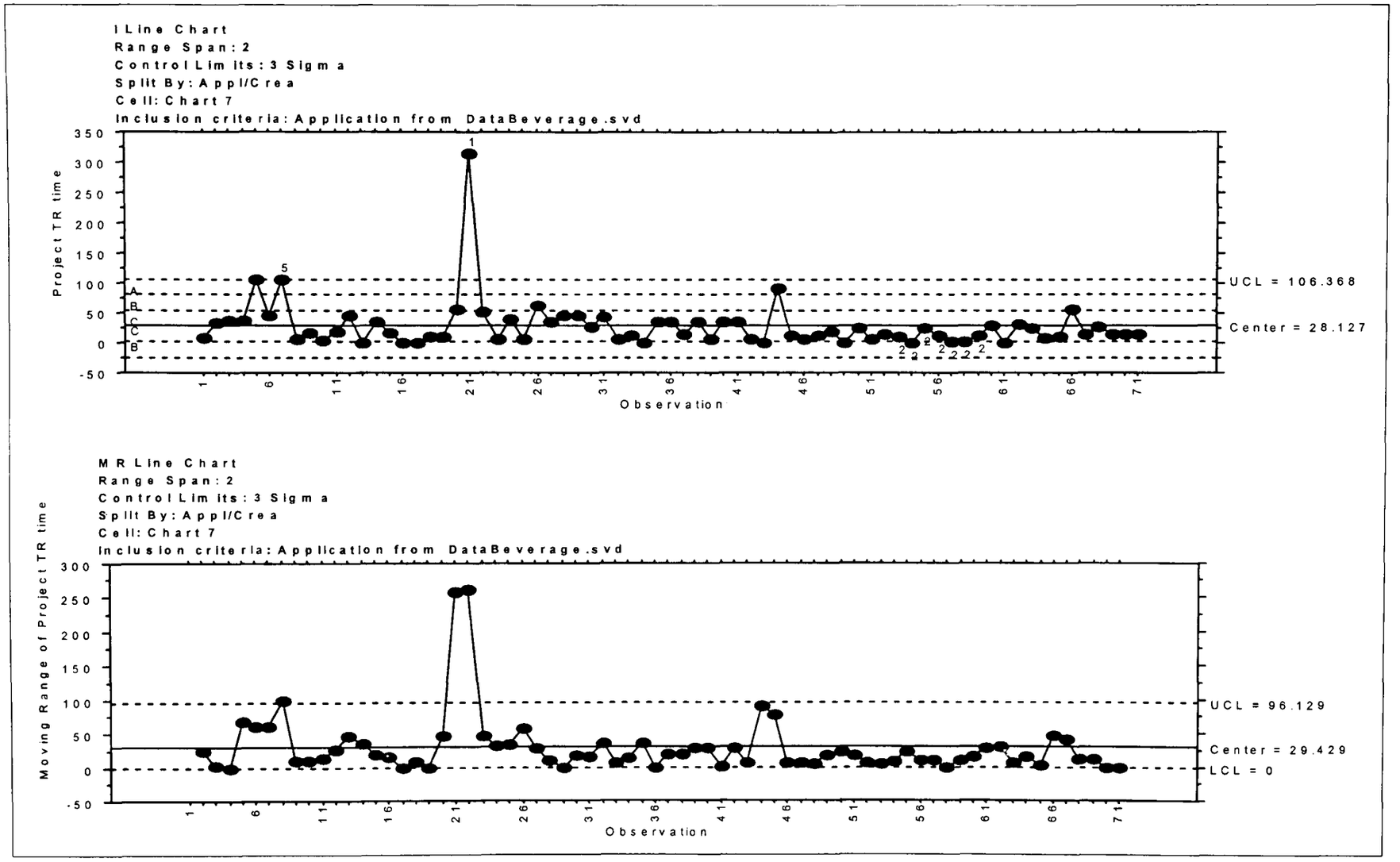

I Line Chart
Range Span: 2
Control Limits: 3 Sigma
Split By: Appl/Crea
Cell: Chart 2
Inclusion criteria: Application from DataBeverage.svd
Project TR time
250
200
150
100
50
0
-50
A
B
C
C
B
UCL = 105.736
Center = 23.127
1
6
11
16
21
26
31
36
41
46
51
56
61
66
71
Observation
MR Line Chart
Range Span: 2
Control Limits: 3 Sigma
Split By: Appl/Crea
Cell: Chart 2
Inclusion criteria: Application from DataBeverage.svd
Moving Range of Project TR time
225
200
175
150
125
100
75
50
25
0
-25
UCL = 101.496
Center = 31.071
LCL = 0
Observation

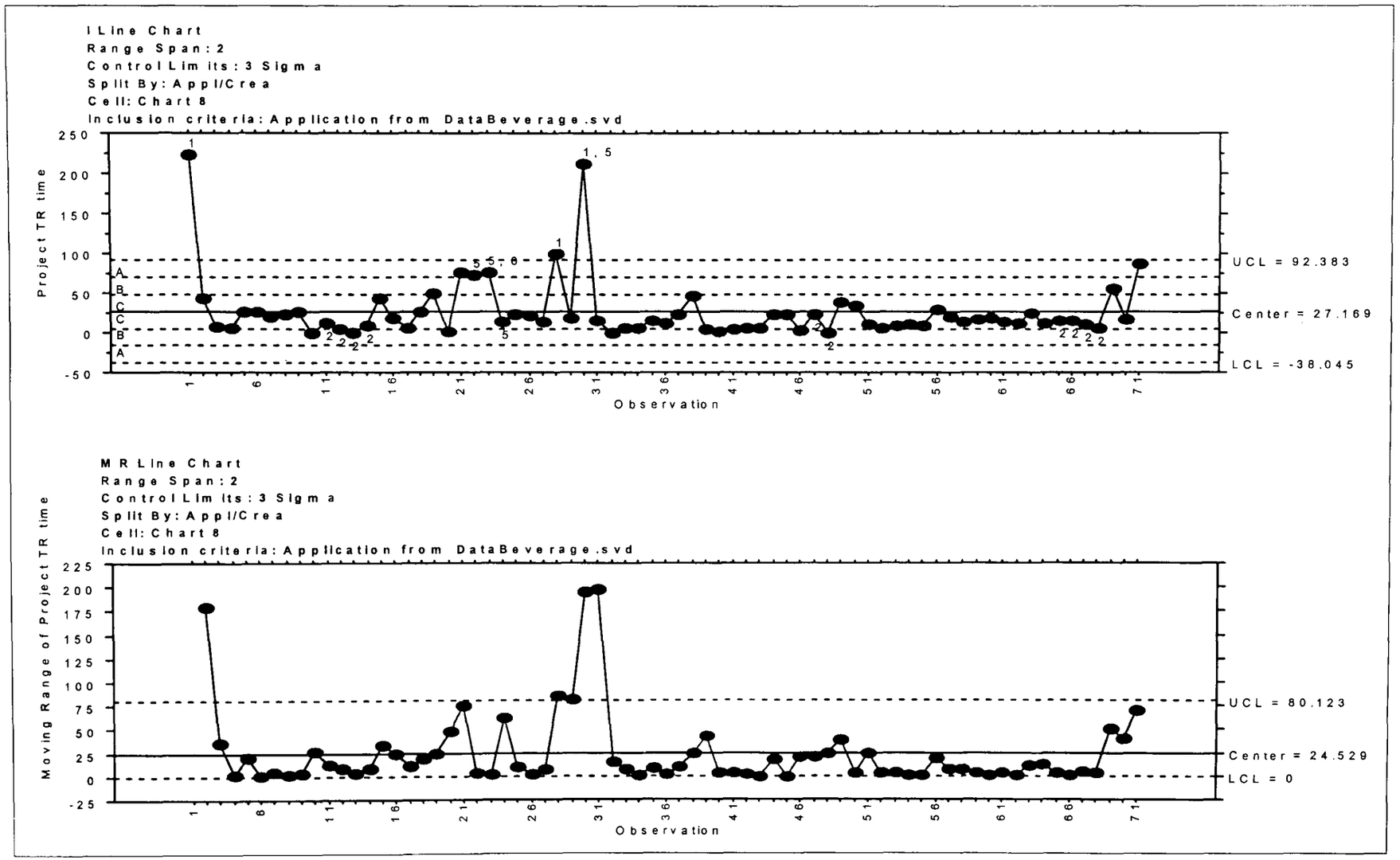

I Line Chart
Range Span: 2
Control Limits: 3 Sigma
Split By: Appl/Crea
Cell: Chart 3
Inclusion criteria: Application from DataBeverage.svd
Project TR time
Observation
UCL = 89.531
Center = 21.507
LCL = -46.517
MR Line Chart
Range Span: 2
Control Limits: 3 Sigma
Split By: Appl/Crea
Cell: Chart 3
Inclusion criteria: Application from DataBeverage.svd
Moving Range of Project TR time
Observation
UCL = 83.577
Center = 25.586
LCL = 0

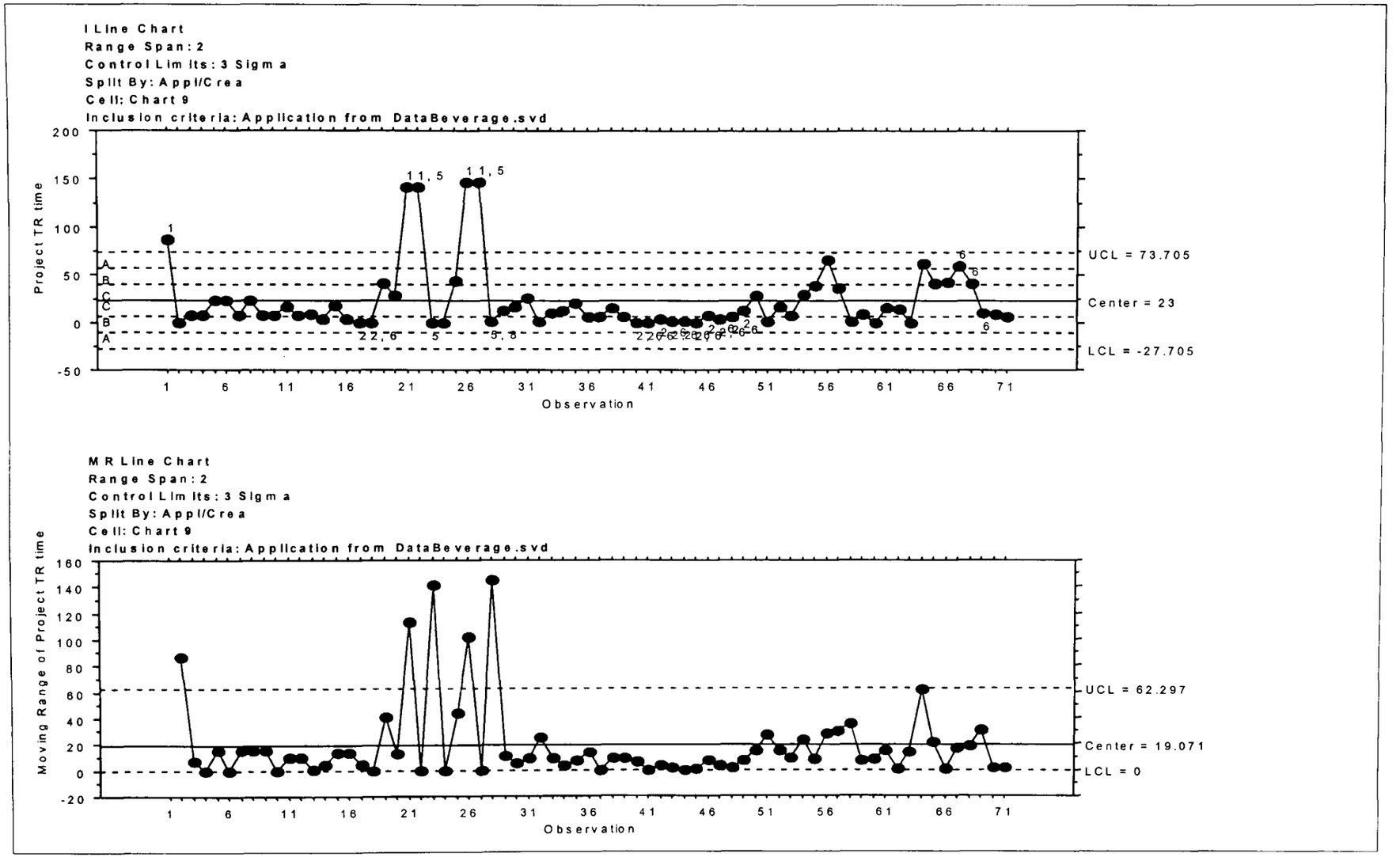

I Line Chart
Range Span: 2
Control Limits: 3 Sigma
Split By: Appl/Crea
Cell: Chart 4
Inclusion criteria: Application from DataBeverage.svd
Project TR time
Observation
UCL = 101.246
Center = 28.056
LCL = -45.133
MR Line Chart
Range Span: 2
Control Limits: 3 Sigma
Split By: Appl/Crea
Cell: Chart 4
Inclusion criteria: Application from DataBeverage.svd
Moving Range of Project TR time
Observation
UCL = 89.923
Center = 27.529
LCL = 0

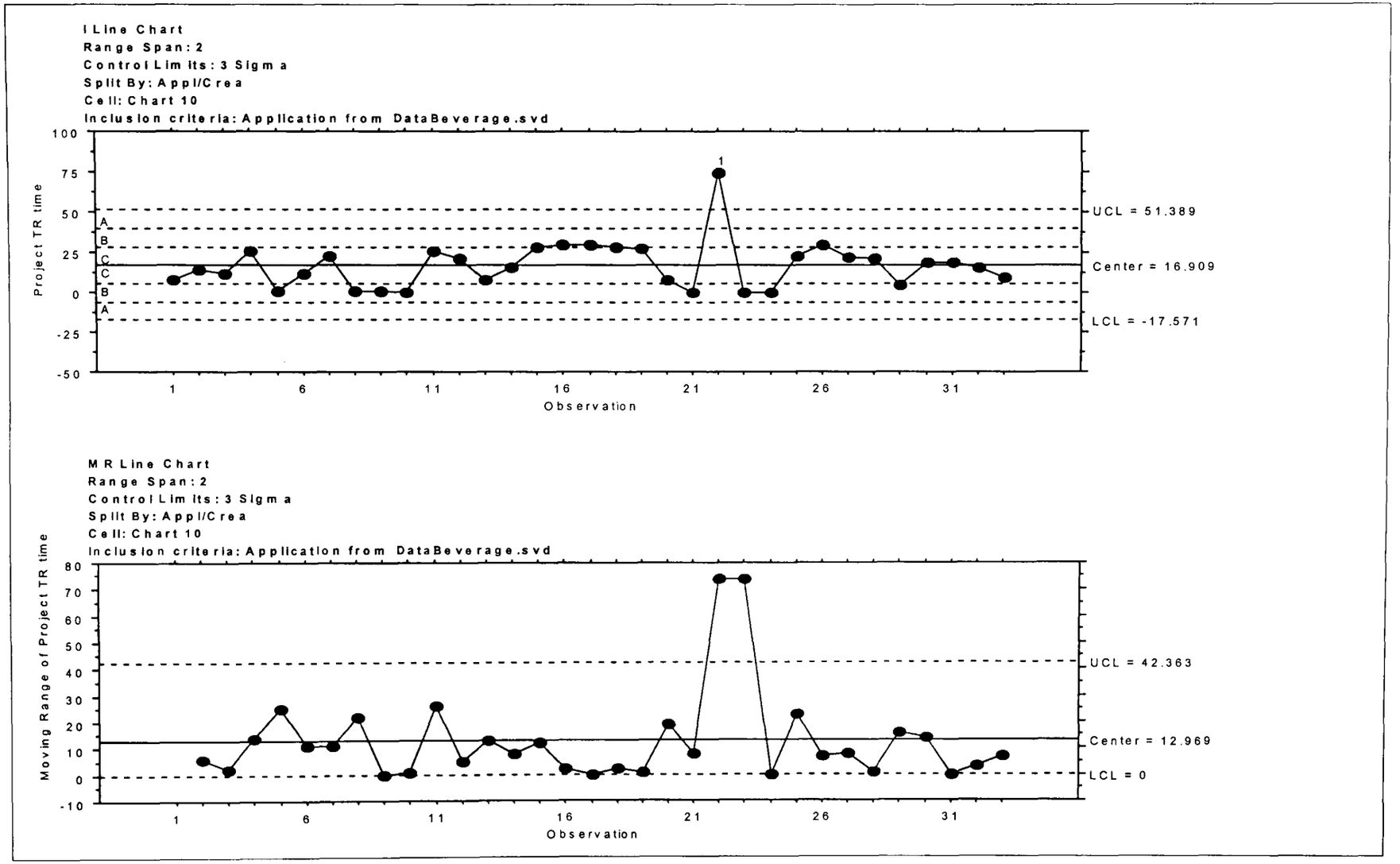

I Line Chart
Range Span: 2
Control Limits: 3 Sigma
Split By: Appl/Crea
Cell: Chart 5
Inclusion criteria: Application from DataBeverage.svd
Project TR time
Observation
UCL = 130.576
Center = 34.901
MR Line Chart
Range Span: 2
Control Limits: 3 Sigma
Split By: Appl/Crea
Cell: Chart 5
Inclusion criteria: Application from DataBeverage.svd
Moving Range of Project TR time
Observation
UCL = 117.548
Center = 35.986
LCL = 0

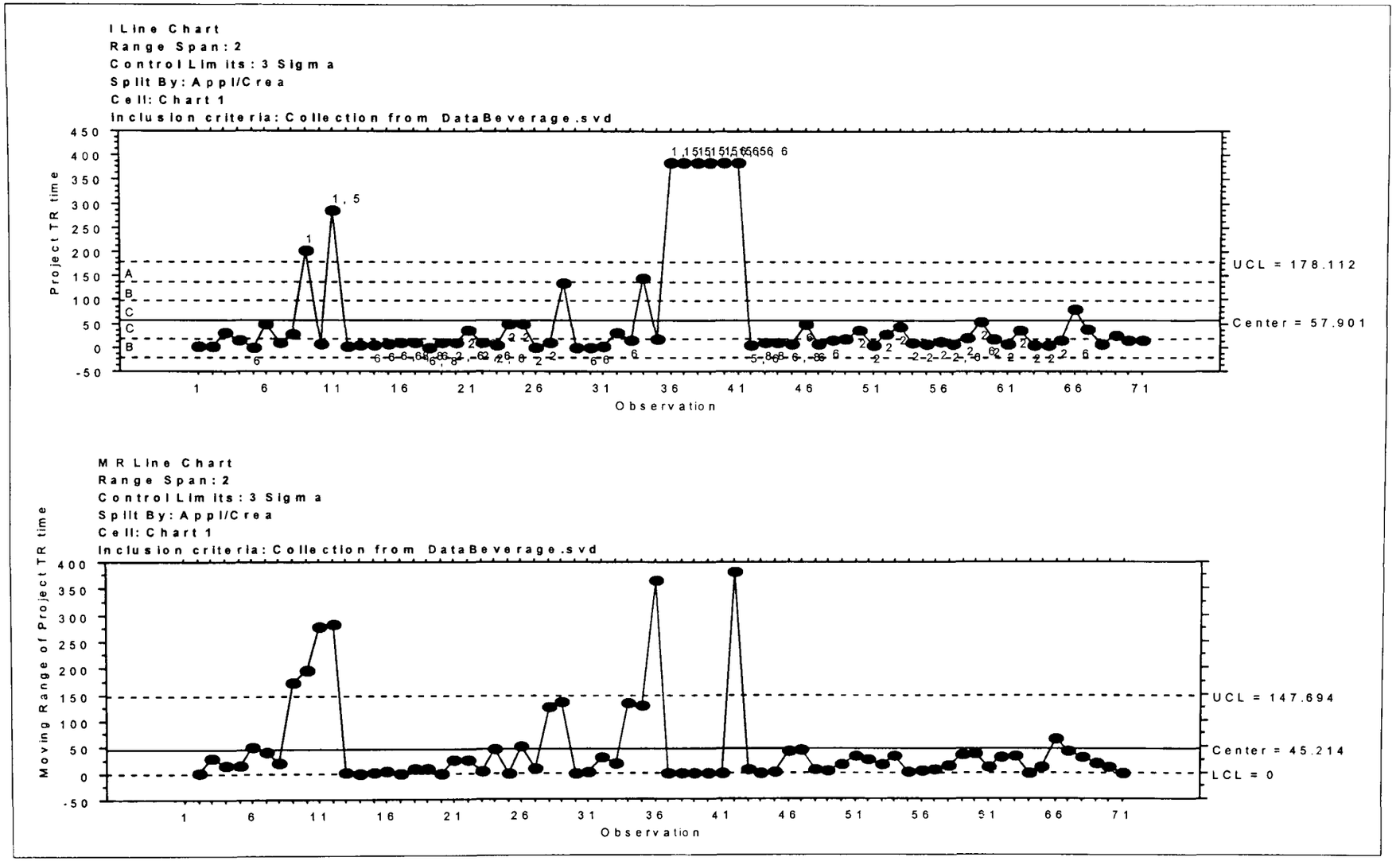

I Line Chart
Range Span: 2
Control Limits: 3 Sigma
Split By: Appl/Crea
Cell: Chart 6
Inclusion criteria: Application from DataBeverage.svd
Project TR time
Observation
UCL = 112.226
Center = 27.718
MR Line Chart
Range Span: 2
Control Limits: 3 Sigma
Split By: Appl/Crea
Cell: Chart 6
Inclusion criteria: Application from DataBeverage.svd
Moving Range of Project TR time
Observation
UCL = 103.829
Center = 31.786
LCL = 0

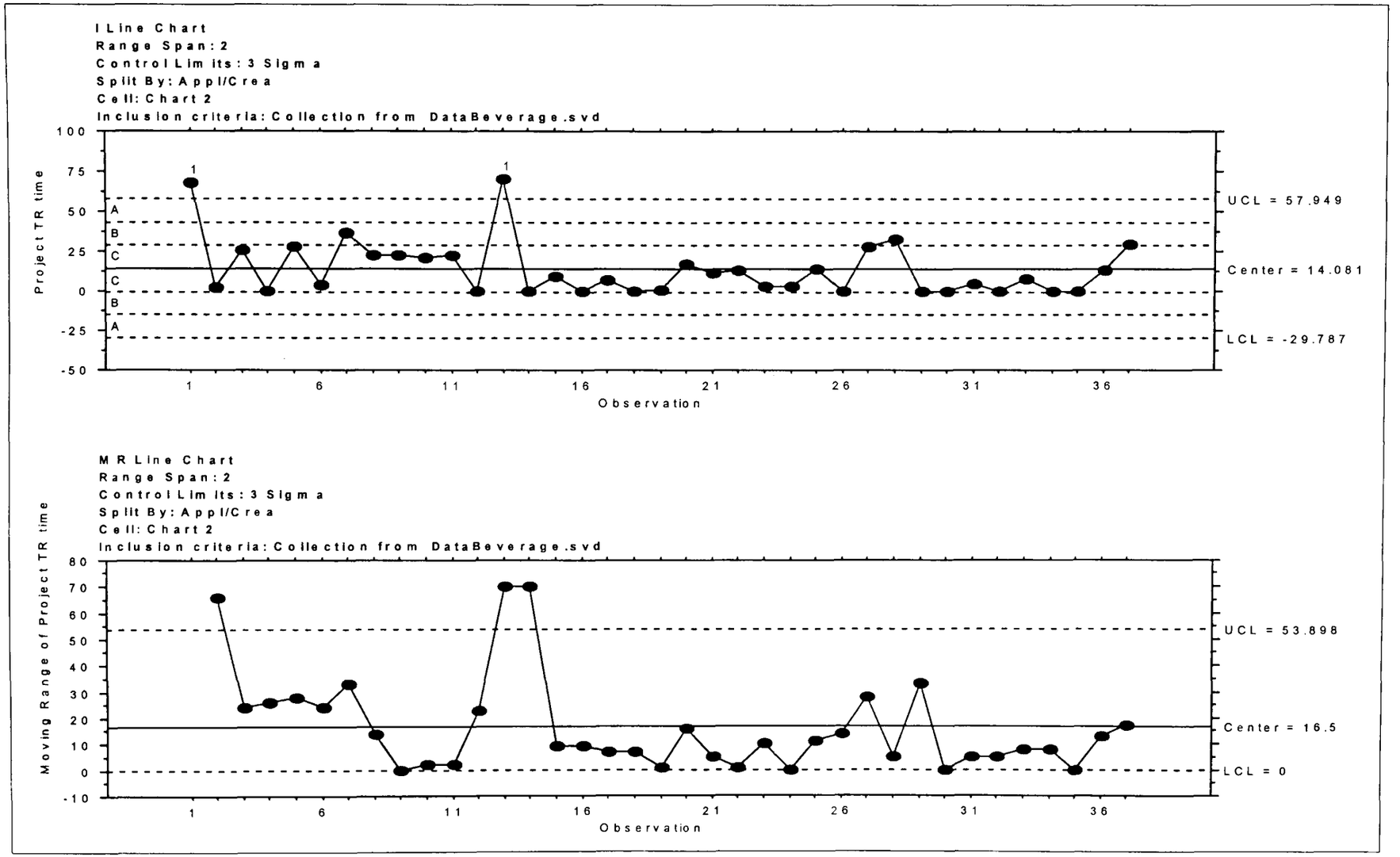

I Line Chart
Range Span: 2
Control Limits: 3 Sigma
Split By: Appl/Crea
Cell: Chart 7
Inclusion criteria: Application from DataBeverage.svd
Project TR time
Observation
UCL = 106.368
Center = 28.127
MR Line Chart
Range Span: 2
Control Limits: 3 Sigma
Split By: Appl/Crea
Cell: Chart 7
Inclusion criteria: Application from DataBeverage.svd
Moving Range of Project TR time
Observation
UCL = 96.129
Center = 29.429
LCL = 0

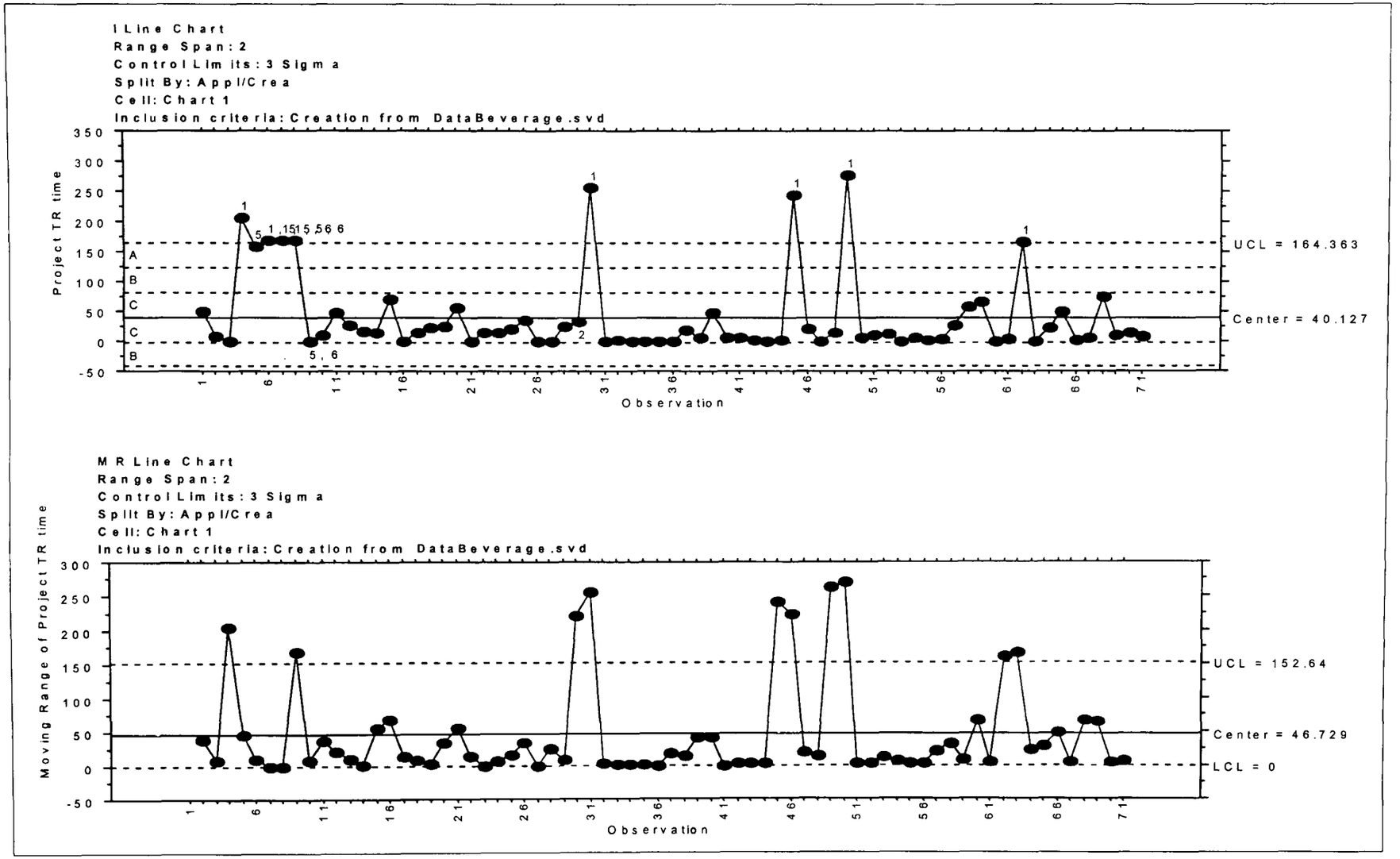

I Line Chart
Range Span: 2
Control Limits: 3 Sigma
Split By: Appl/Crea
Cell: Chart 8
Inclusion criteria: Application from DataBeverage.svd
Project TR time
Observation
UCL = 92.383
Center = 27.169
LCL = -38.045
MR Line Chart
Range Span: 2
Control Limits: 3 Sigma
Split By: Appl/Crea
Cell: Chart 8
Inclusion criteria: Application from DataBeverage.svd
Moving Range of Project TR time
Observation
UCL = 80.123
Center = 24.529
LCL = 0

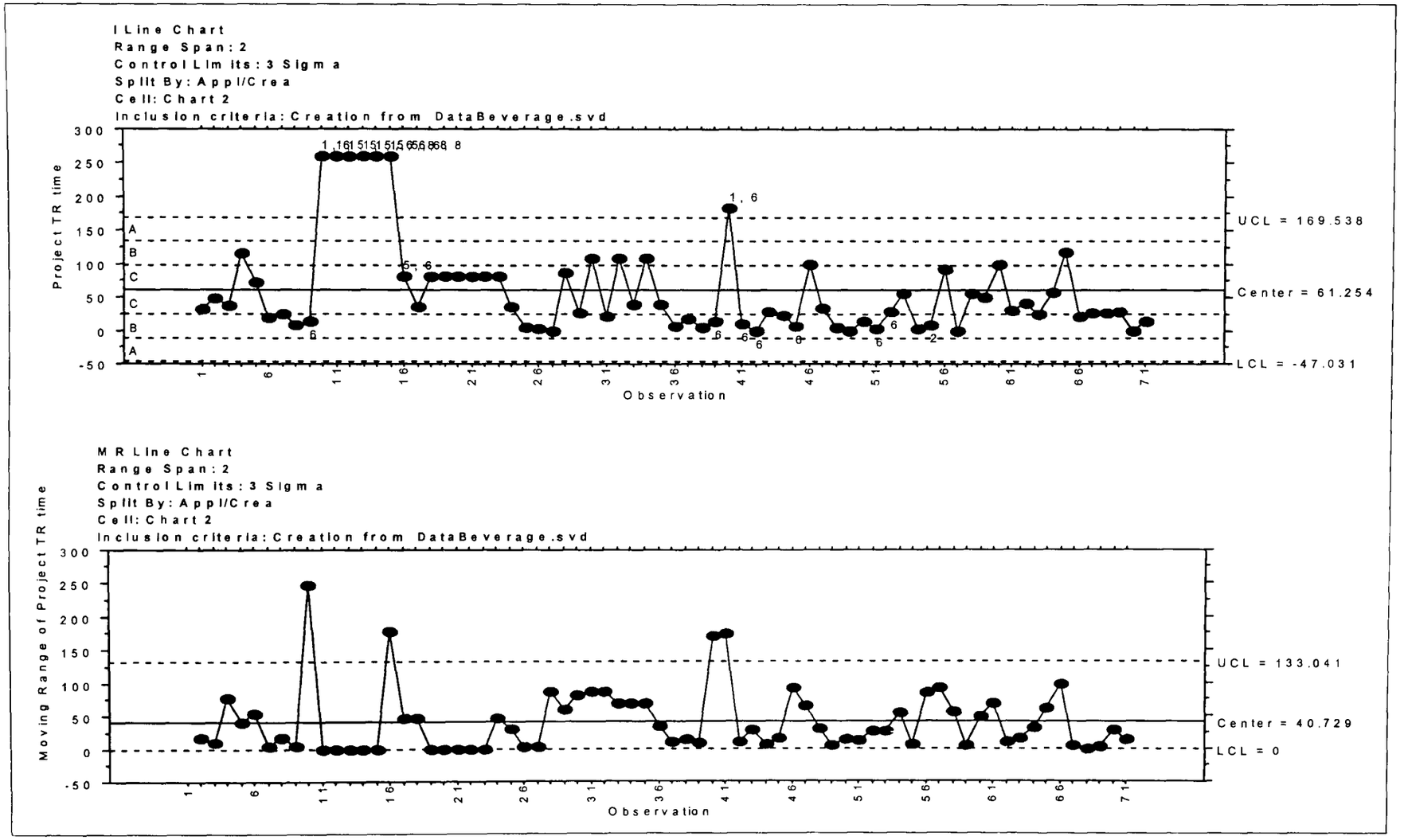

I Line Chart
Range Span: 2
Control Limits: 3 Sigma
Split By: Appl/Crea
Cell: Chart 9
Inclusion criteria: Application from DataBeverage.svd
Project TR time
Observation
UCL = 73.705
Center = 23
LCL = -27.705
MR Line Chart
Range Span: 2
Control Limits: 3 Sigma
Split By: Appl/Crea
Cell: Chart 9
Inclusion criteria: Application from DataBeverage.svd
Moving Range of Project TR time
Observation
UCL = 62.297
Center = 19.071
LCL = 0

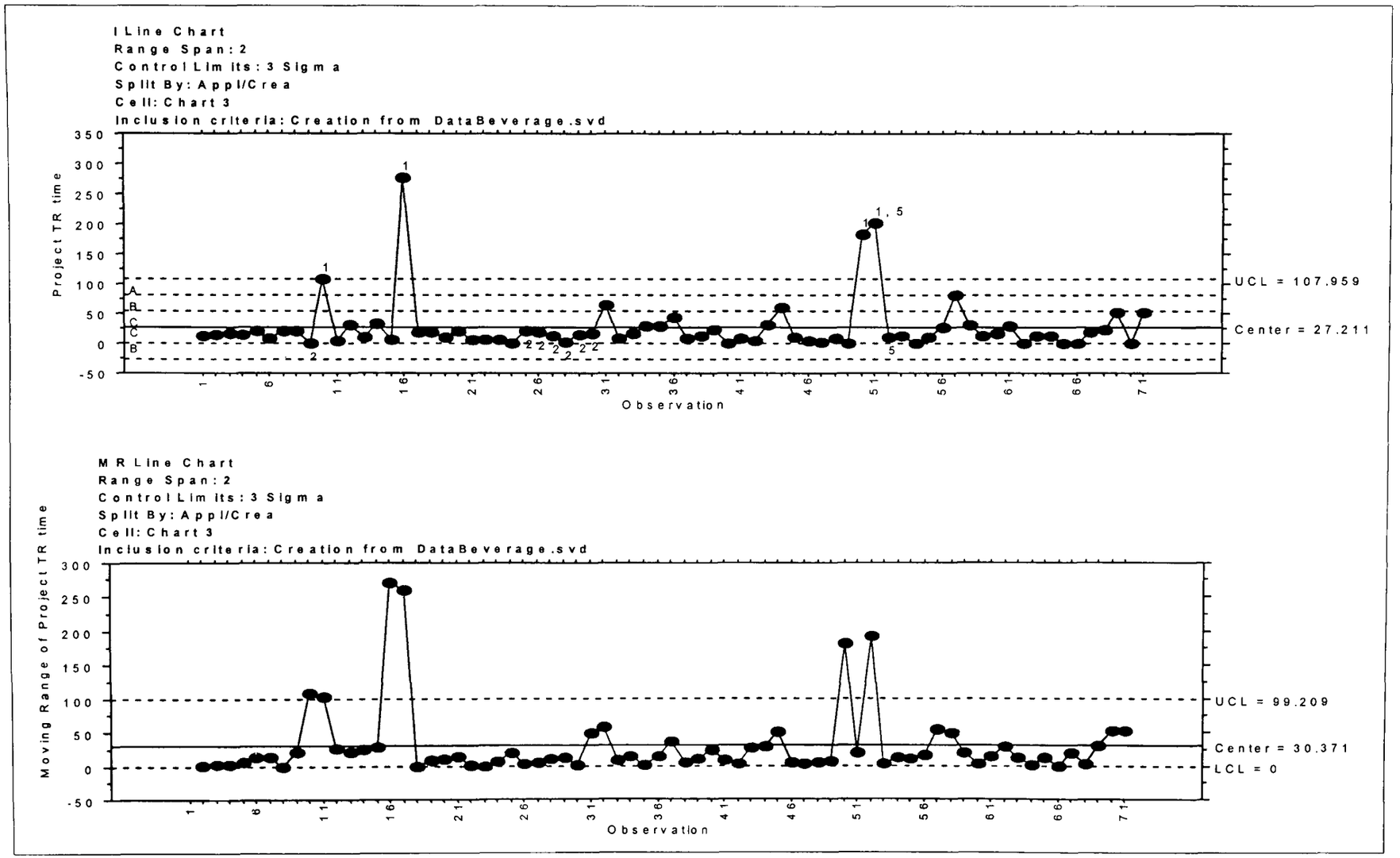

I Line Chart
Range Span: 2
Control Limits: 3 Sigma
Split By: Appl/Crea
Cell: Chart 10
Inclusion criteria: Application from DataBeverage.svd
Project TR time
100
75
50
25
0
-25
-50
A
B
C
C
B
A
1
UCL = 51.389
Center = 16.909
LCL = -17.571
1
6
11
16
21
26
31
Observation
MR Line Chart
Range Span: 2
Control Limits: 3 Sigma
Split By: Appl/Crea
Cell: Chart 10
Inclusion criteria: Application from DataBeverage.svd
Moving Range of Project TR time
80
70
60
50
40
30
20
10
0
-10
UCL = 42.363
Center = 12.969
LCL = 0
1
6
11
16
21
26
31
Observation

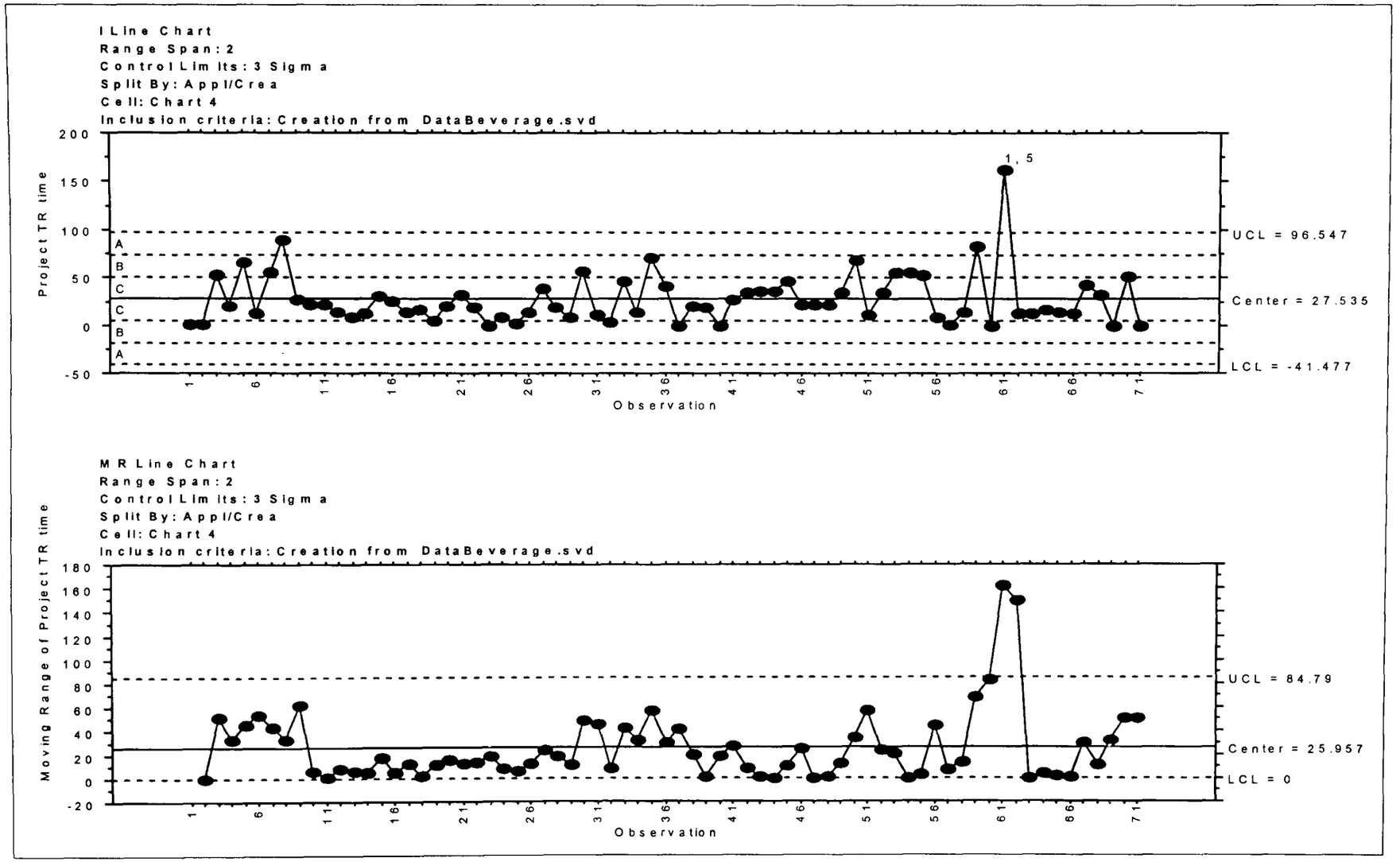

I Line Chart
Range Span: 2
Control Limits: 3 Sigma
Split By: Appl/Crea
Cell: Chart 1
Inclusion criteria: Collection from DataBeverage.svd
Project TR time
Observation
UCL = 178.112
Center = 57.901
M R Line Chart
Range Span: 2
Control Limits: 3 Sigma
Split By: Appl/Crea
Cell: Chart 1
Inclusion criteria: Collection from DataBeverage.svd
Moving Range of Project TR time
Observation
UCL = 147.694
Center = 45.214
LCL = 0

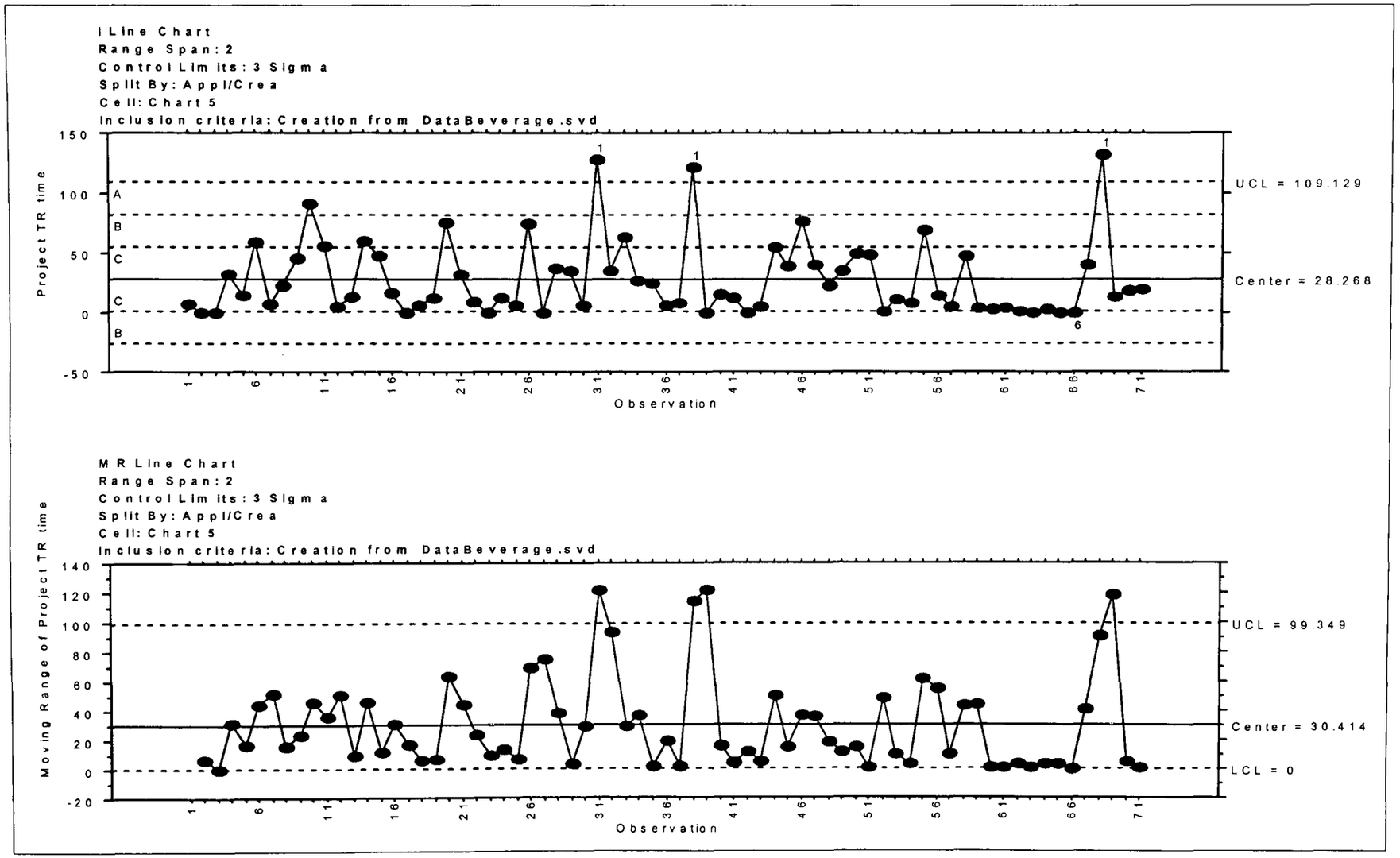

I Line Chart
Range Span: 2
Control Limits: 3 Sigma
Split By: Appl/Crea
Cell: Chart 2
Inclusion criteria: Collection from DataBeverage.svd
Project TR time
100
75
50
25
0
-25
-50
A
B
C
C
B
A
1
1
UCL = 57.949
Center = 14.081
LCL = -29.787
1
6
11
16
21
26
31
36
Observation
M R Line Chart
Range Span: 2
Control Limits: 3 Sigma
Split By: Appl/Crea
Cell: Chart 2
Inclusion criteria: Collection from DataBeverage.svd
Moving Range of Project TR time
80
70
60
50
40
30
20
10
0
-10
UCL = 53.898
Center = 16.5
LCL = 0
1
6
11
16
21
26
31
36
Observation

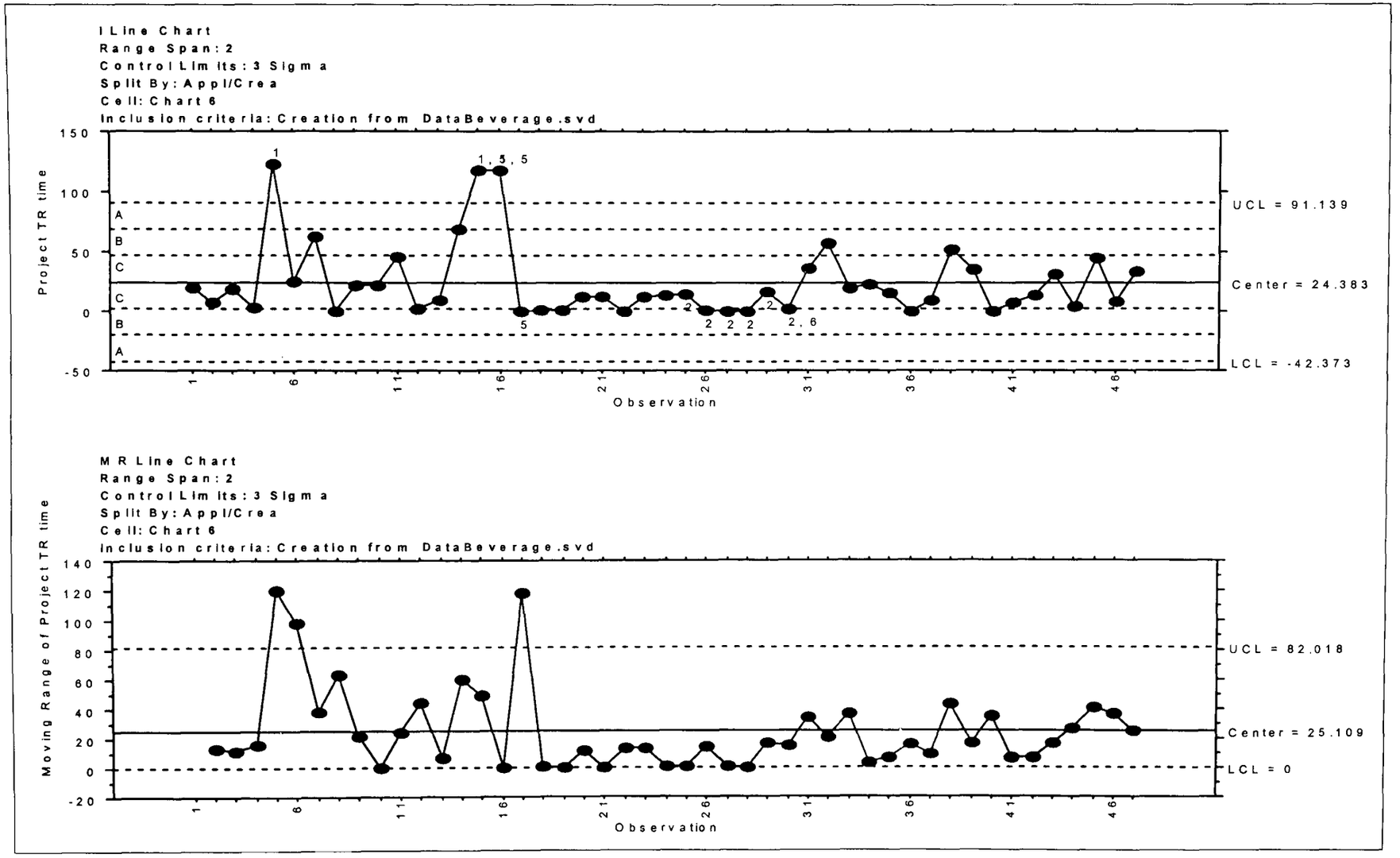

I Line Chart
Range Span: 2
Control Limits: 3 Sigma
Split By: Appl/Crea
Cell: Chart 1
Inclusion criteria: Creation from DataBeverage.svd
Project TR time
Observation
UCL = 164.363
Center = 40.127
MR Line Chart
Range Span: 2
Control Limits: 3 Sigma
Split By: Appl/Crea
Cell: Chart 1
Inclusion criteria: Creation from DataBeverage.svd
Moving Range of Project TR time
Observation
UCL = 152.64
Center = 46.729
LCL = 0

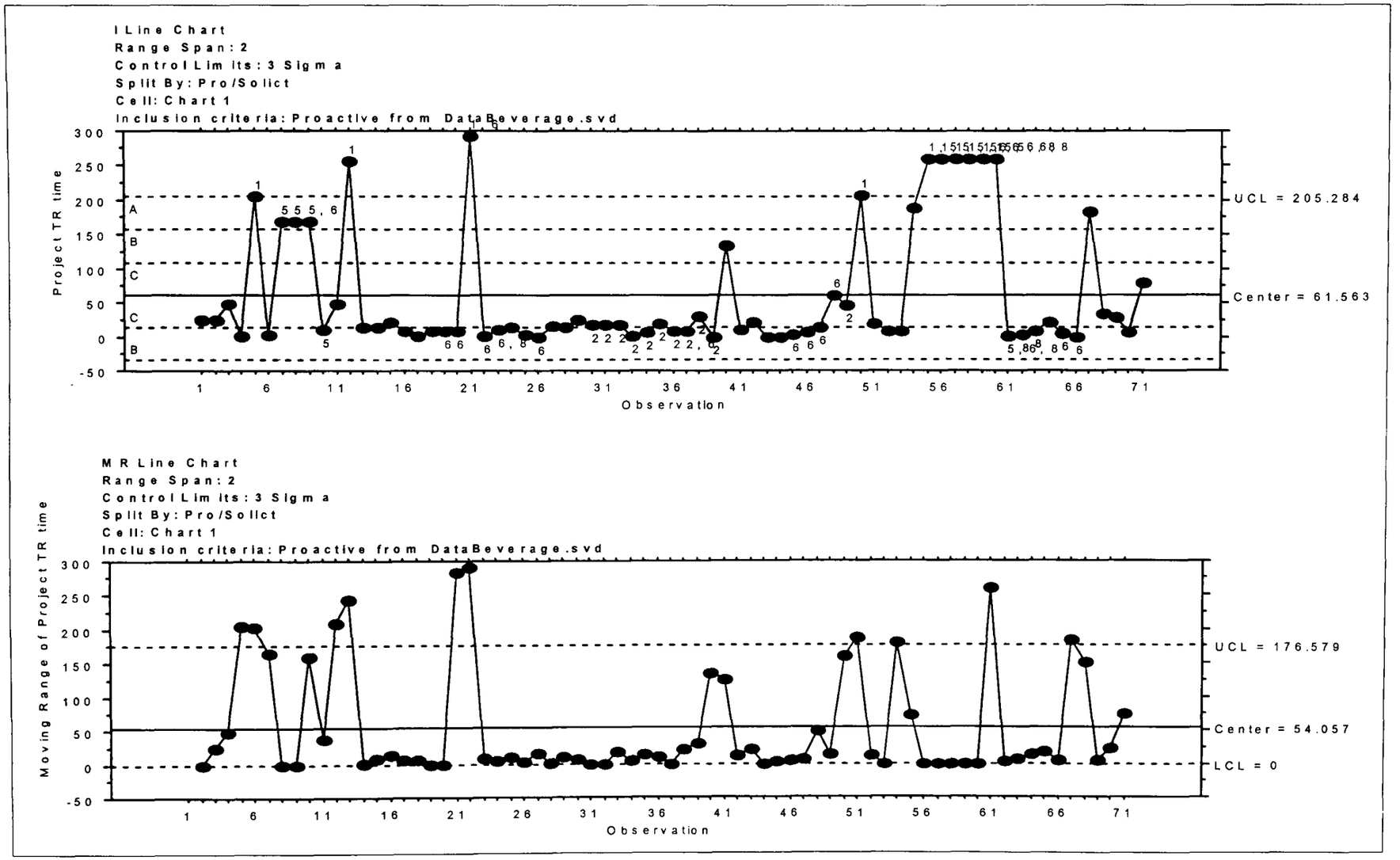

I Line Chart
Range Span: 2
Control Limits: 3 Sigma
Split By: Appl/Crea
Cell: Chart 2
Inclusion criteria: Creation from DataBeverage.svd
Project TR time
Observation
UCL = 169.538
Center = 61.254
LCL = -47.031
M R Line Chart
Range Span: 2
Control Limits: 3 Sigma
Split By: Appl/Crea
Cell: Chart 2
Inclusion criteria: Creation from DataBeverage.svd
Moving Range of Project TR time
Observation
UCL = 133.041
Center = 40.729
LCL = 0

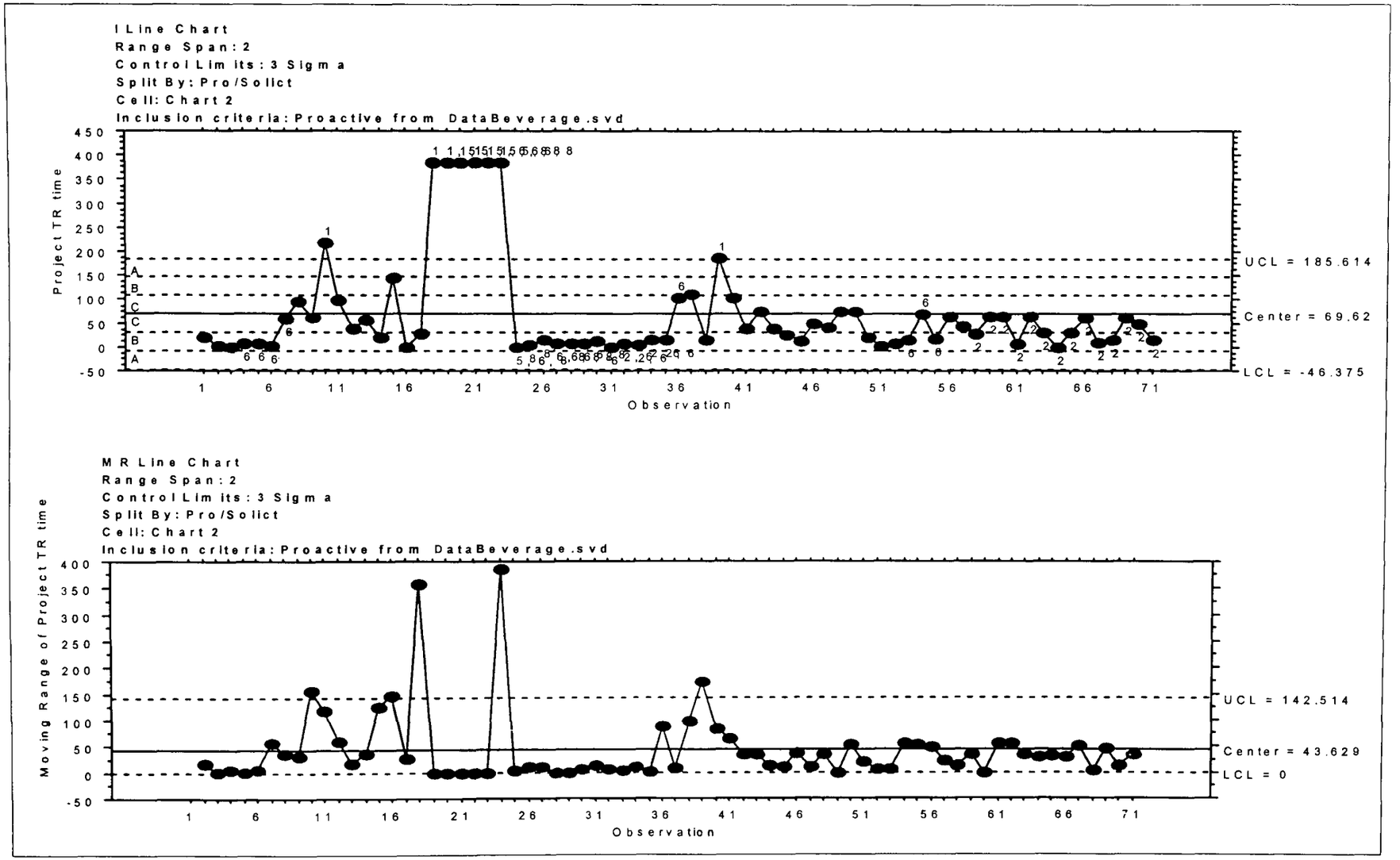

I Line Chart
Range Span: 2
Control Limits: 3 Sigma
Split By: Appl/Crea
Cell: Chart 3
Inclusion criteria: Creation from DataBeverage.svd
Project TR time
Observation
UCL = 107.959
Center = 27.211
MR Line Chart
Range Span: 2
Control Limits: 3 Sigma
Split By: Appl/Crea
Cell: Chart 3
Inclusion criteria: Creation from DataBeverage.svd
Moving Range of Project TR time
Observation
UCL = 99.209
Center = 30.371
LCL = 0

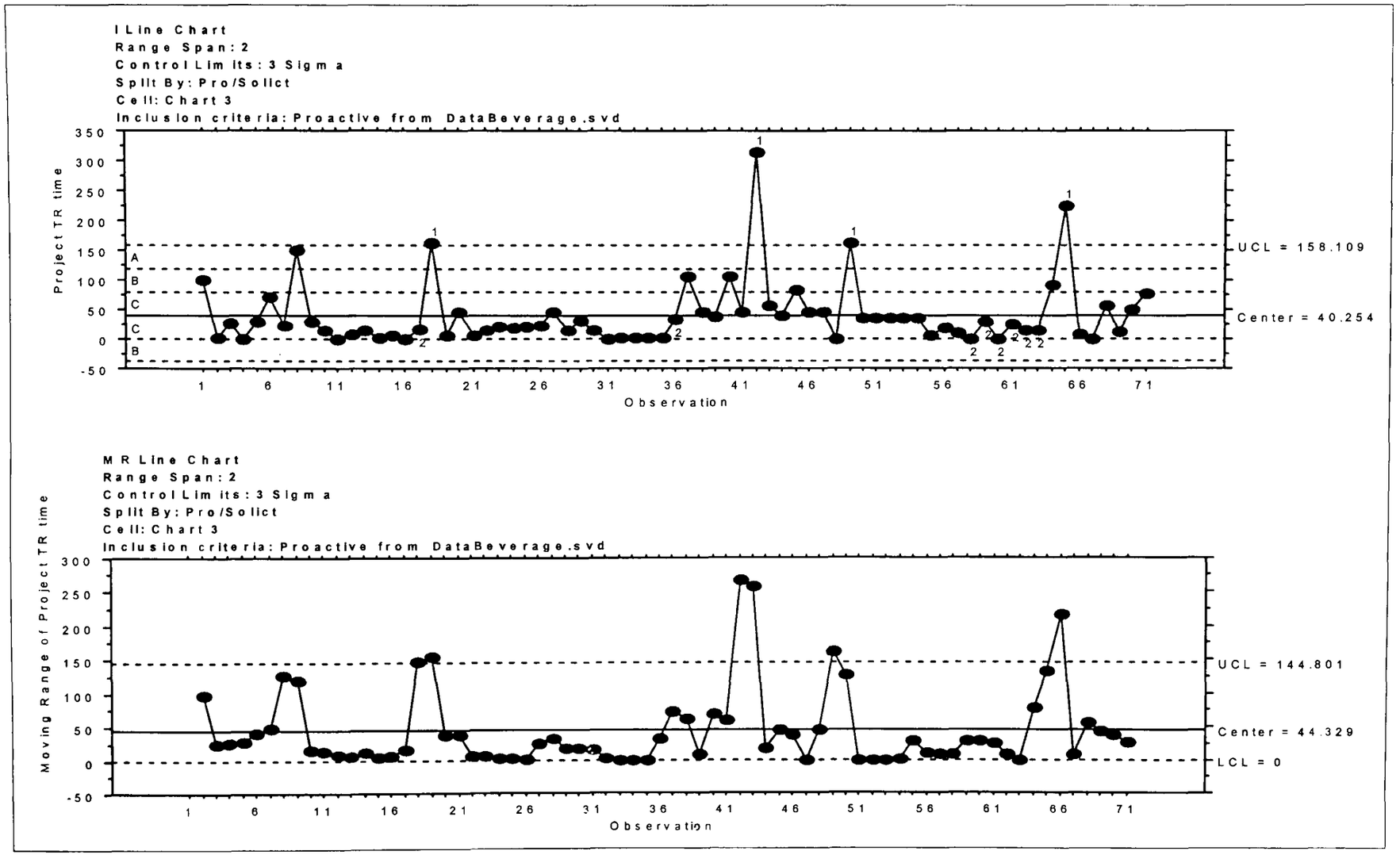

I Line Chart
Range Span: 2
Control Limits: 3 Sigma
Split By: Appl/Crea
Cell: Chart 4
Inclusion criteria: Creation from DataBeverage.svd
Project TR time
200
150
100
50
0
-50
A
B
C
C
B
A
1, 5
UCL = 96.547
Center = 27.535
LCL = -41.477
1
6
11
16
21
26
31
36
41
46
51
56
61
66
71
Observation
MR Line Chart
Range Span: 2
Control Limits: 3 Sigma
Split By: Appl/Crea
Cell: Chart 4
Inclusion criteria: Creation from DataBeverage.svd
Moving Range of Project TR time
180
160
140
120
100
80
60
40
20
0
-20
UCL = 84.79
Center = 25.957
LCL = 0
1
6
11
16
21
26
31
36
41
46
51
56
61
66
71
Observation

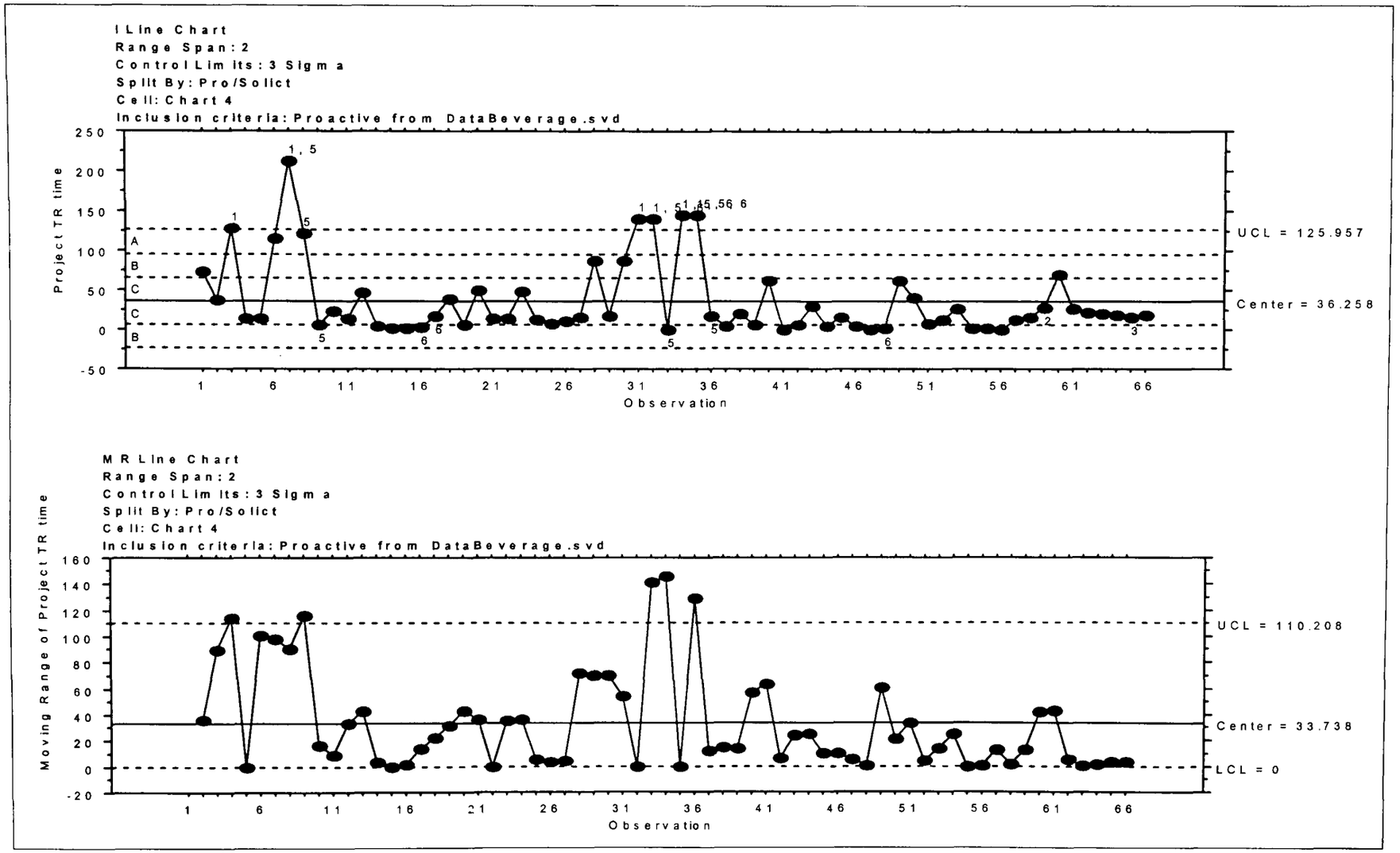

I Line Chart
Range Span: 2
Control Limits: 3 Sigma
Split By: Appl/Crea
Cell: Chart 5
Inclusion criteria: Creation from DataBeverage.svd
Project TR time
150
100
50
0
-50
A
B
C
C
B
UCL = 109.129
Center = 28.268
1
1
1
6
1
6
11
16
21
26
31
36
41
46
51
56
61
66
71
Observation
MR Line Chart
Range Span: 2
Control Limits: 3 Sigma
Split By: Appl/Crea
Cell: Chart 5
Inclusion criteria: Creation from DataBeverage.svd
Moving Range of Project TR time
140
120
100
80
60
40
20
0
-20
UCL = 99.349
Center = 30.414
LCL = 0
1
6
11
16
21
26
31
36
41
46
51
56
61
66
71
Observation

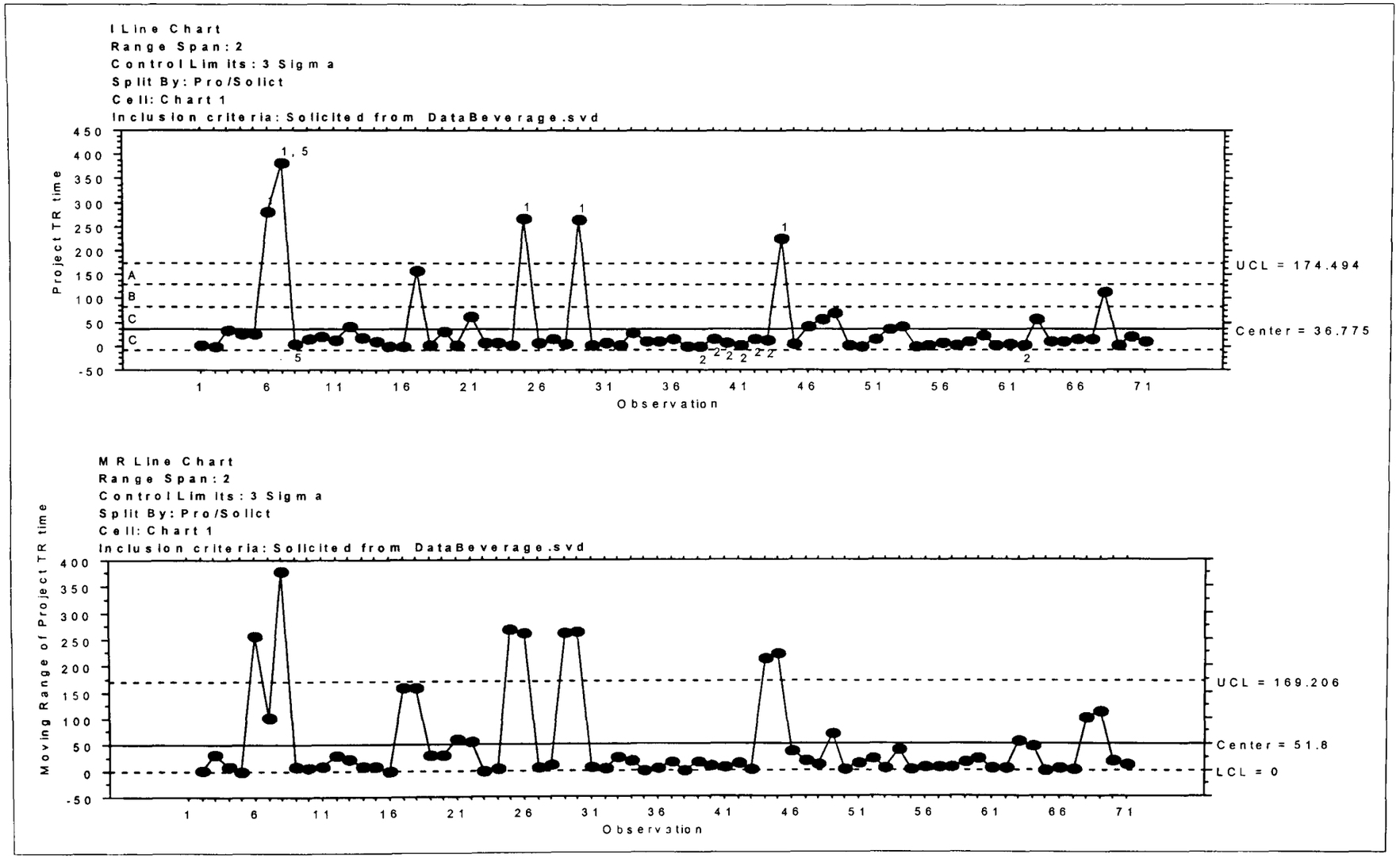

I Line Chart
Range Span: 2
Control Limits: 3 Sigma
Split By: Appl/Crea
Cell: Chart 6
Inclusion criteria: Creation from DataBeverage.svd
Project TR time
150
100
50
0
-50
A
B
C
C
B
A
1
1, 5, 5
5
2
2 2 2
2, 2
2, 6
UCL = 91.139
Center = 24.383
LCL = -42.373
1
6
11
16
21
26
31
36
41
46
Observation
MR Line Chart
Range Span: 2
Control Limits: 3 Sigma
Split By: Appl/Crea
Cell: Chart 6
Inclusion criteria: Creation from DataBeverage.svd
Moving Range of Project TR time
140
120
100
80
60
40
20
0
-20
UCL = 82.018
Center = 25.109
LCL = 0
1
6
11
16
21
26
31
36
41
46
Observation

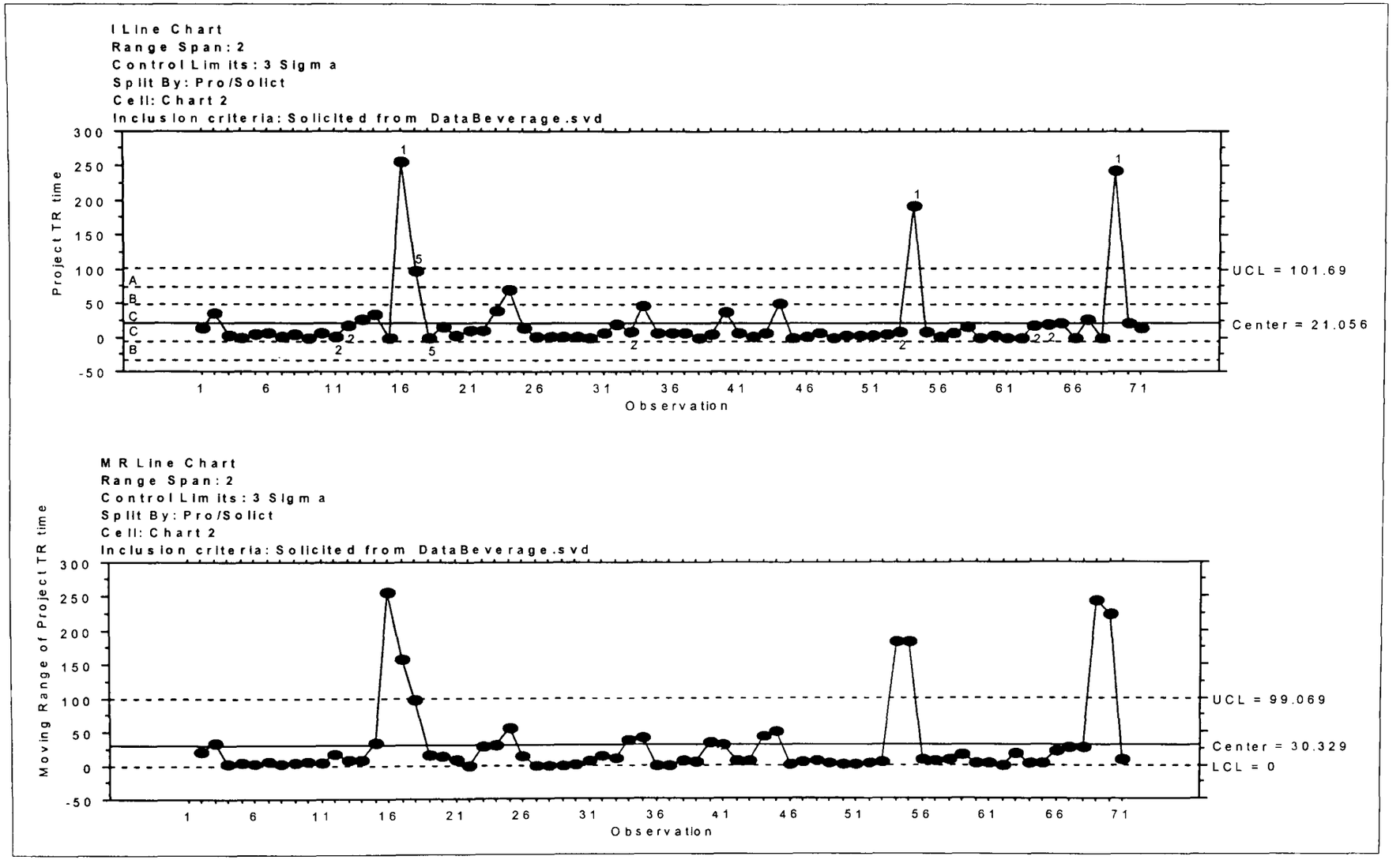

I Line Chart
Range Span: 2
Control Limits: 3 Sigma
Split By: Pro/Solict
Cell: Chart 1
Inclusion criteria: Proactive from DataBeverage.svd
Project TR time
Observation
UCL = 205.284
Center = 61.563
M R Line Chart
Range Span: 2
Control Limits: 3 Sigma
Split By: Pro/Solict
Cell: Chart 1
Inclusion criteria: Proactive from DataBeverage.svd
Moving Range of Project TR time
Observation
UCL = 176.579
Center = 54.057
LCL = 0

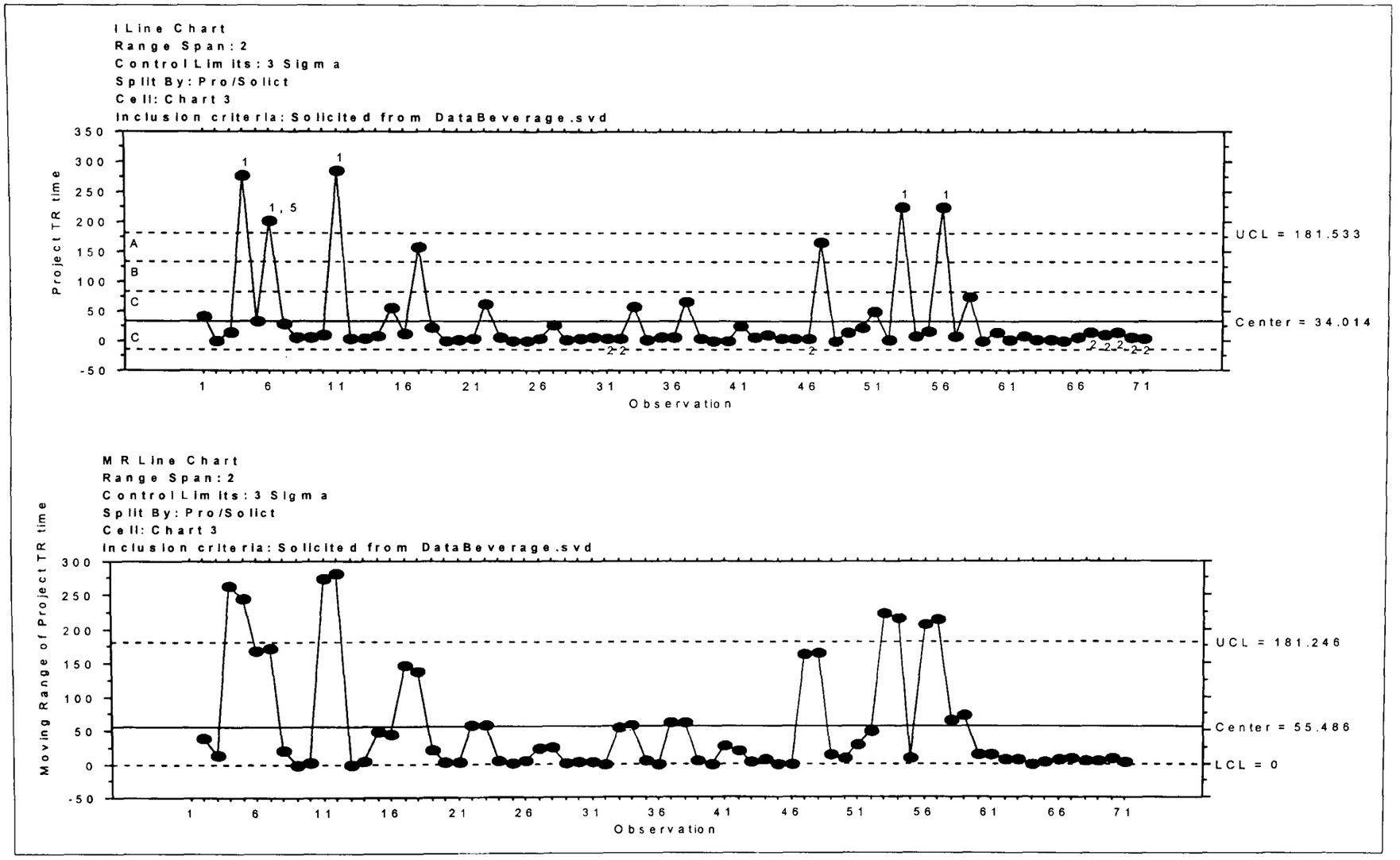

I Line Chart
Range Span: 2
Control Limits: 3 Sigma
Split By: Pro/Solict
Cell: Chart 2
Inclusion criteria: Proactive from DataBeverage.svd
Project TR time
Observation
UCL = 185.614
Center = 69.62
LCL = -46.375
MR Line Chart
Range Span: 2
Control Limits: 3 Sigma
Split By: Pro/Solict
Cell: Chart 2
Inclusion criteria: Proactive from DataBeverage.svd
Moving Range of Project TR time
Observation
UCL = 142.514
Center = 43.629
LCL = 0

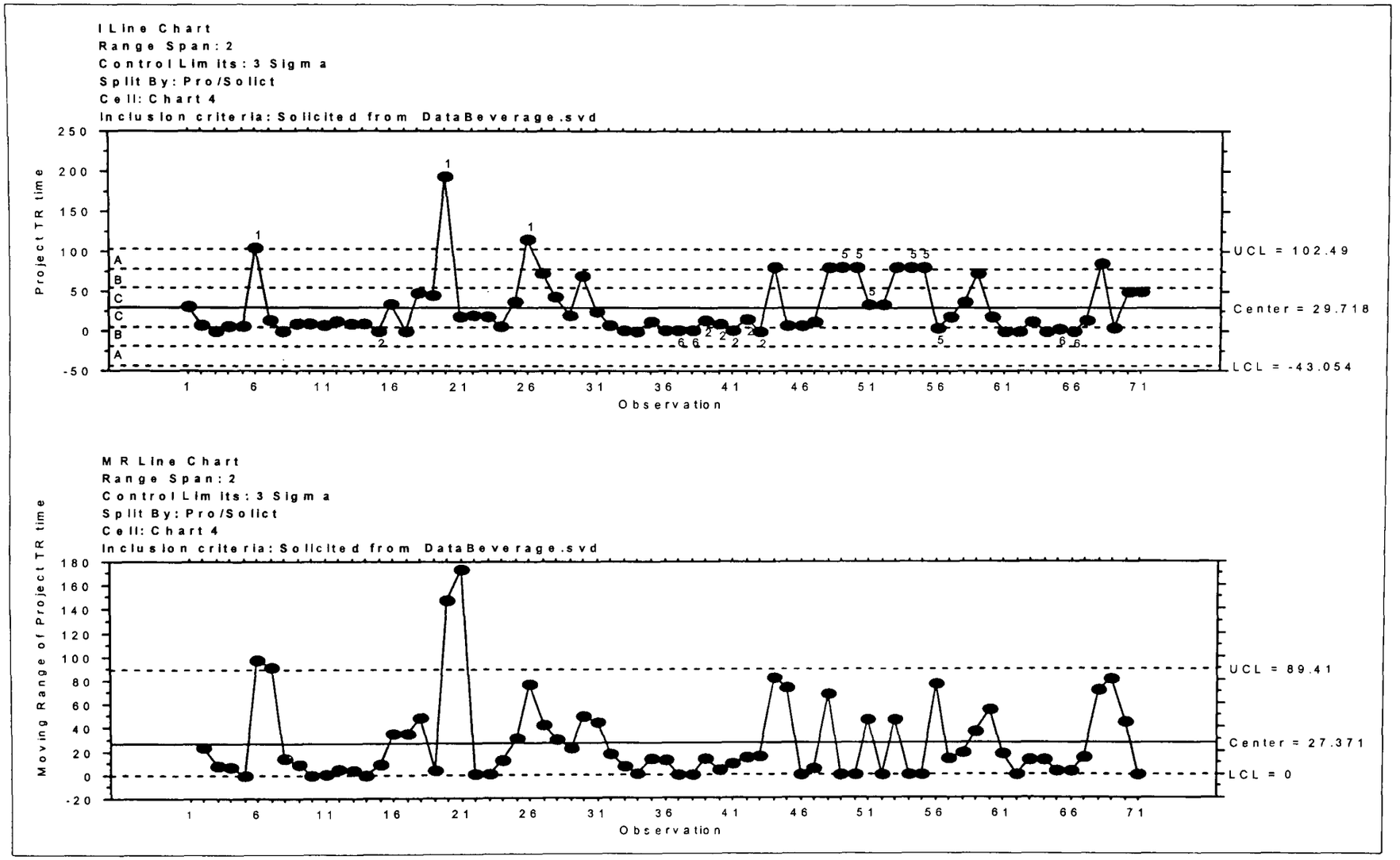

I Line Chart
Range Span: 2
Control Limits: 3 Sigma
Split By: Pro/Solict
Cell: Chart 3
Inclusion criteria: Proactive from DataBeverage.svd
Project TR time
Observation
UCL = 158.109
Center = 40.254
M R Line Chart
Range Span: 2
Control Limits: 3 Sigma
Split By: Pro/Solict
Cell: Chart 3
Inclusion criteria: Proactive from DataBeverage.svd
Moving Range of Project TR time
Observation
UCL = 144.801
Center = 44.329
LCL = 0

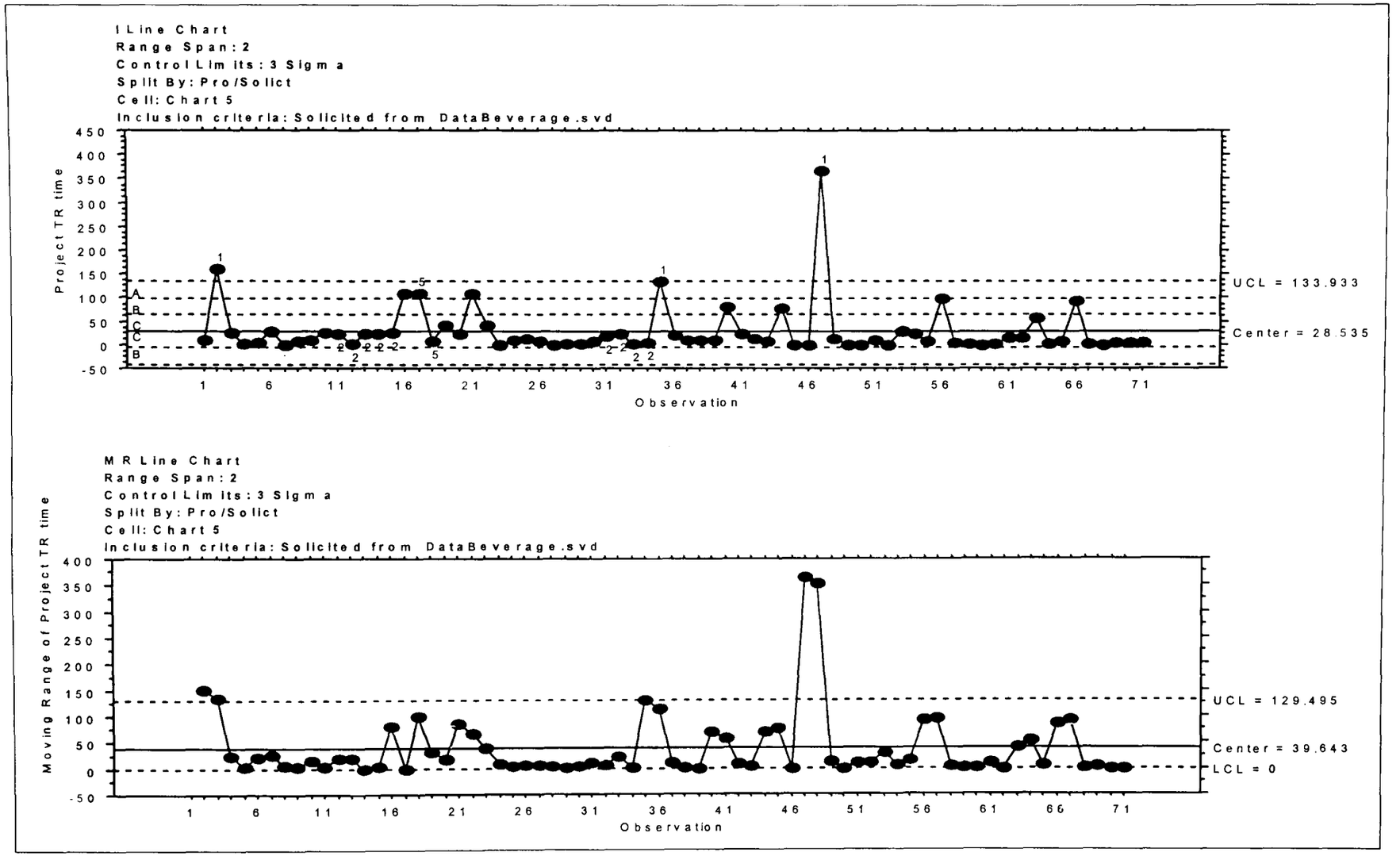

I Line Chart
Range Span: 2
Control Limits: 3 Sigma
Split By: Pro/Solict
Cell: Chart 4
Inclusion criteria: Proactive from DataBeverage.svd
Project TR time
Observation
UCL = 125.957
Center = 36.258
MR Line Chart
Range Span: 2
Control Limits: 3 Sigma
Split By: Pro/Solict
Cell: Chart 4
Inclusion criteria: Proactive from DataBeverage.svd
Moving Range of Project TR time
Observation
UCL = 110.208
Center = 33.738
LCL = 0

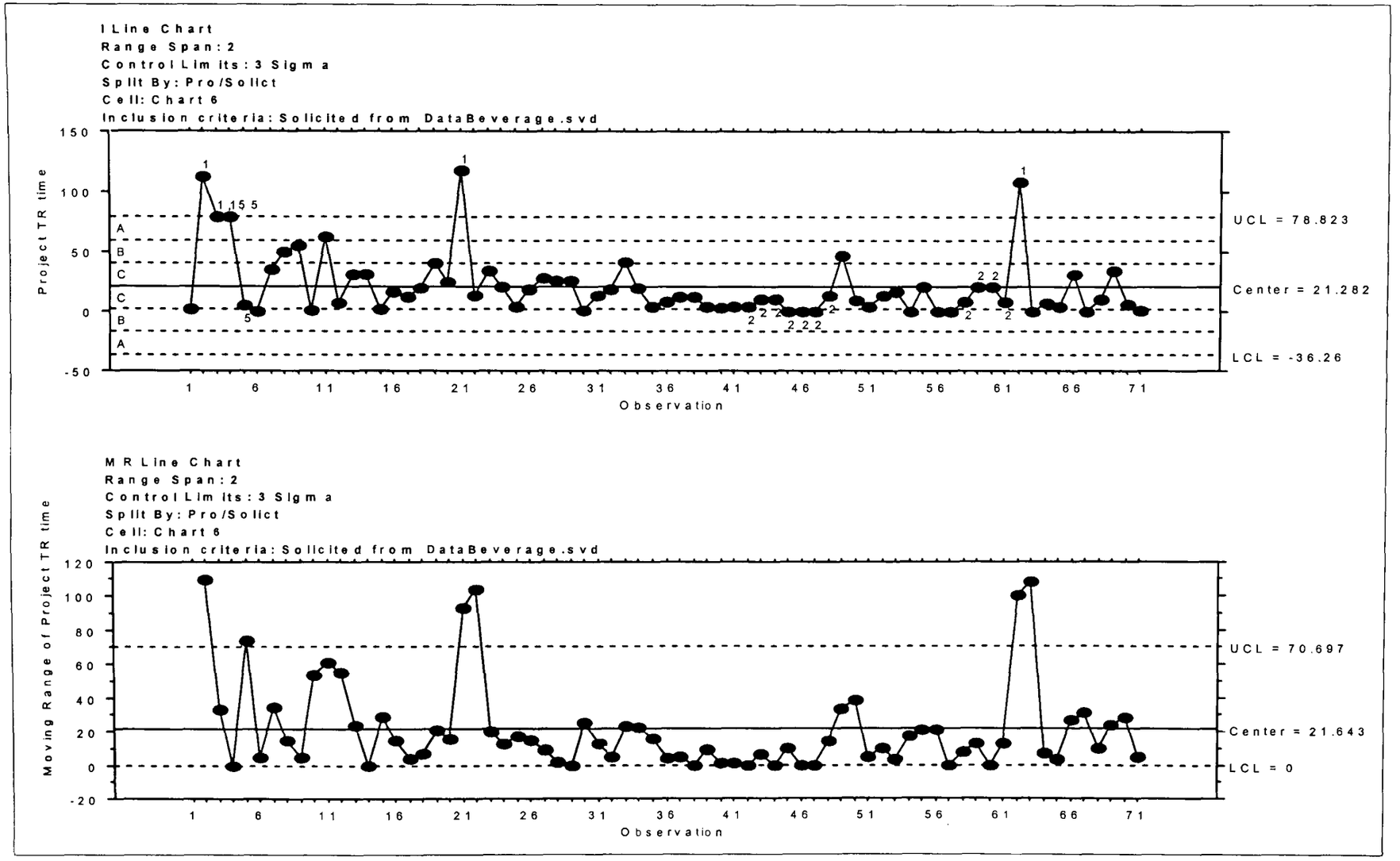

I Line Chart
Range Span: 2
Control Limits: 3 Sigma
Split By: Pro/Solict
Cell: Chart 1
Inclusion criteria: Solicited from DataBeverage.svd
Project TR time
Observation
UCL = 174.494
Center = 36.775
A
B
C
C
MR Line Chart
Range Span: 2
Control Limits: 3 Sigma
Split By: Pro/Solict
Cell: Chart 1
Inclusion criteria: Solicited from DataBeverage.svd
Moving Range of Project TR time
Observation
UCL = 169.206
Center = 51.8
LCL = 0

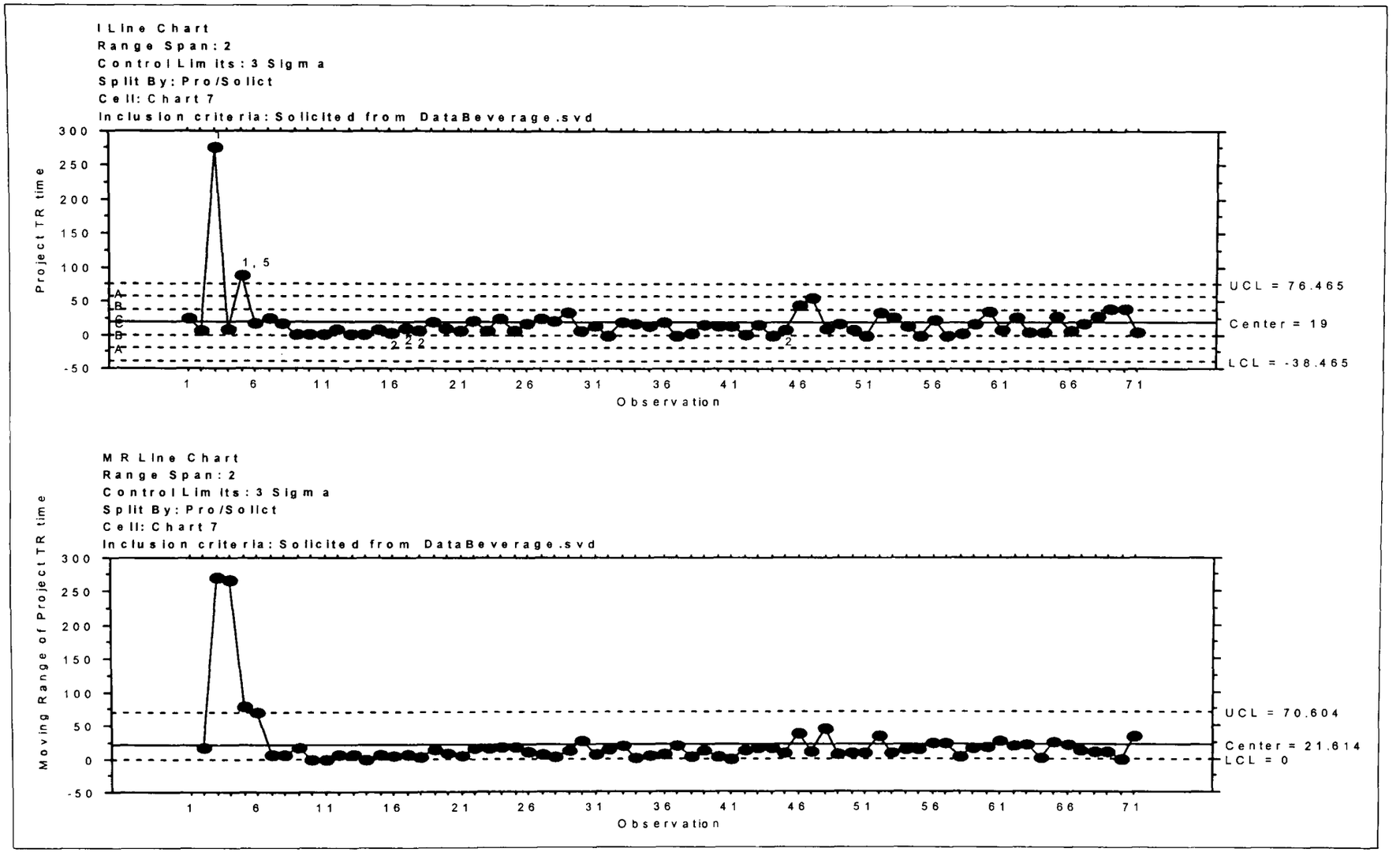

I Line Chart
Range Span: 2
Control Limits: 3 Sigma
Split By: Pro/Solict
Cell: Chart 2
Inclusion criteria: Solicited from DataBeverage.svd
Project TR time
Observation
UCL = 101.69
Center = 21.056
MR Line Chart
Range Span: 2
Control Limits: 3 Sigma
Split By: Pro/Solict
Cell: Chart 2
Inclusion criteria: Solicited from DataBeverage.svd
Moving Range of Project TR time
Observation
UCL = 99.069
Center = 30.329
LCL = 0

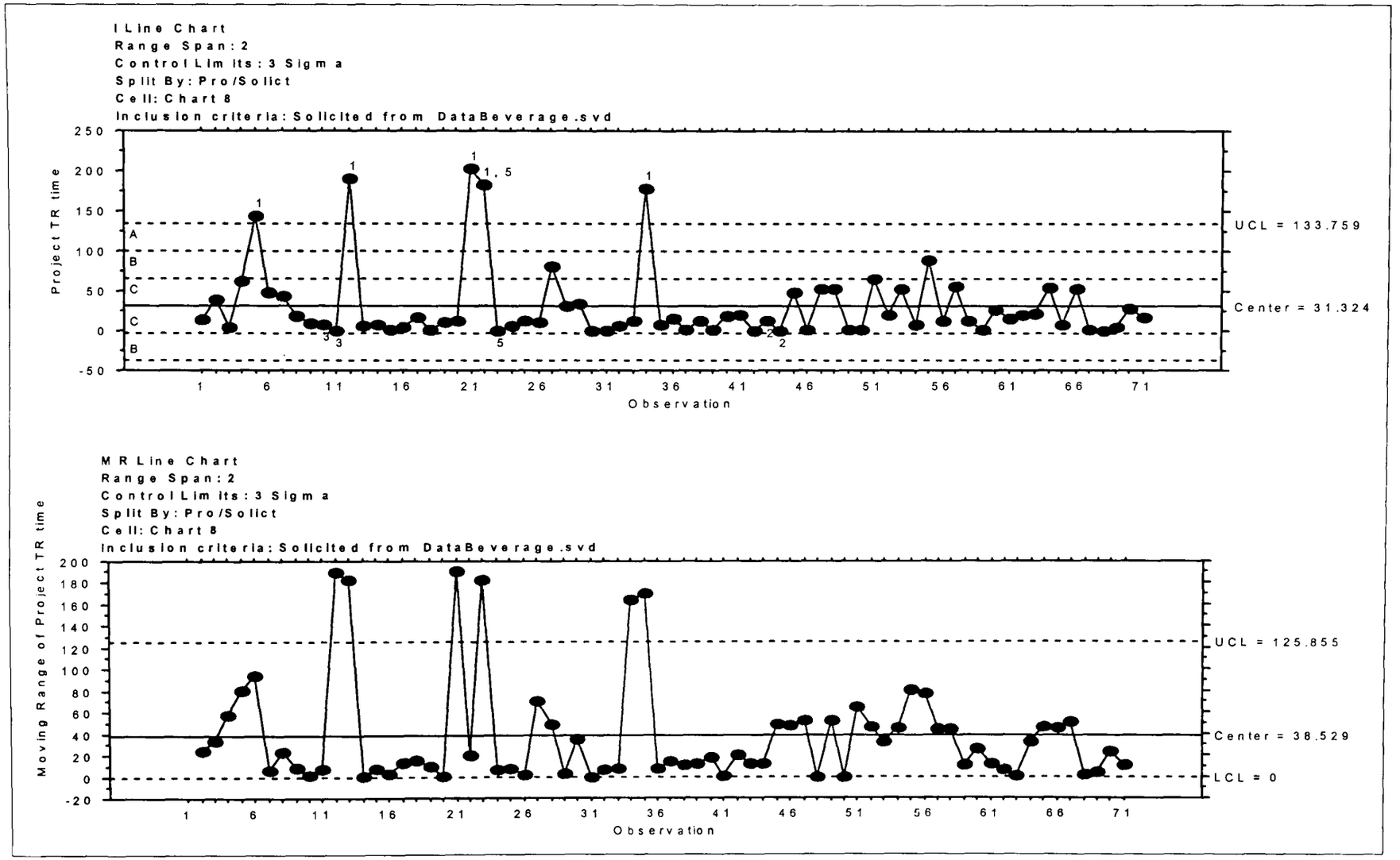

I Line Chart
Range Span: 2
Control Limits: 3 Sigma
Split By: Pro/Solict
Cell: Chart 3
Inclusion criteria: Solicited from DataBeverage.svd
Project TR time
Observation
UCL = 181.533
Center = 34.014
MR Line Chart
Range Span: 2
Control Limits: 3 Sigma
Split By: Pro/Solict
Cell: Chart 3
Inclusion criteria: Solicited from DataBeverage.svd
Moving Range of Project TR time
Observation
UCL = 181.246
Center = 55.486
LCL = 0

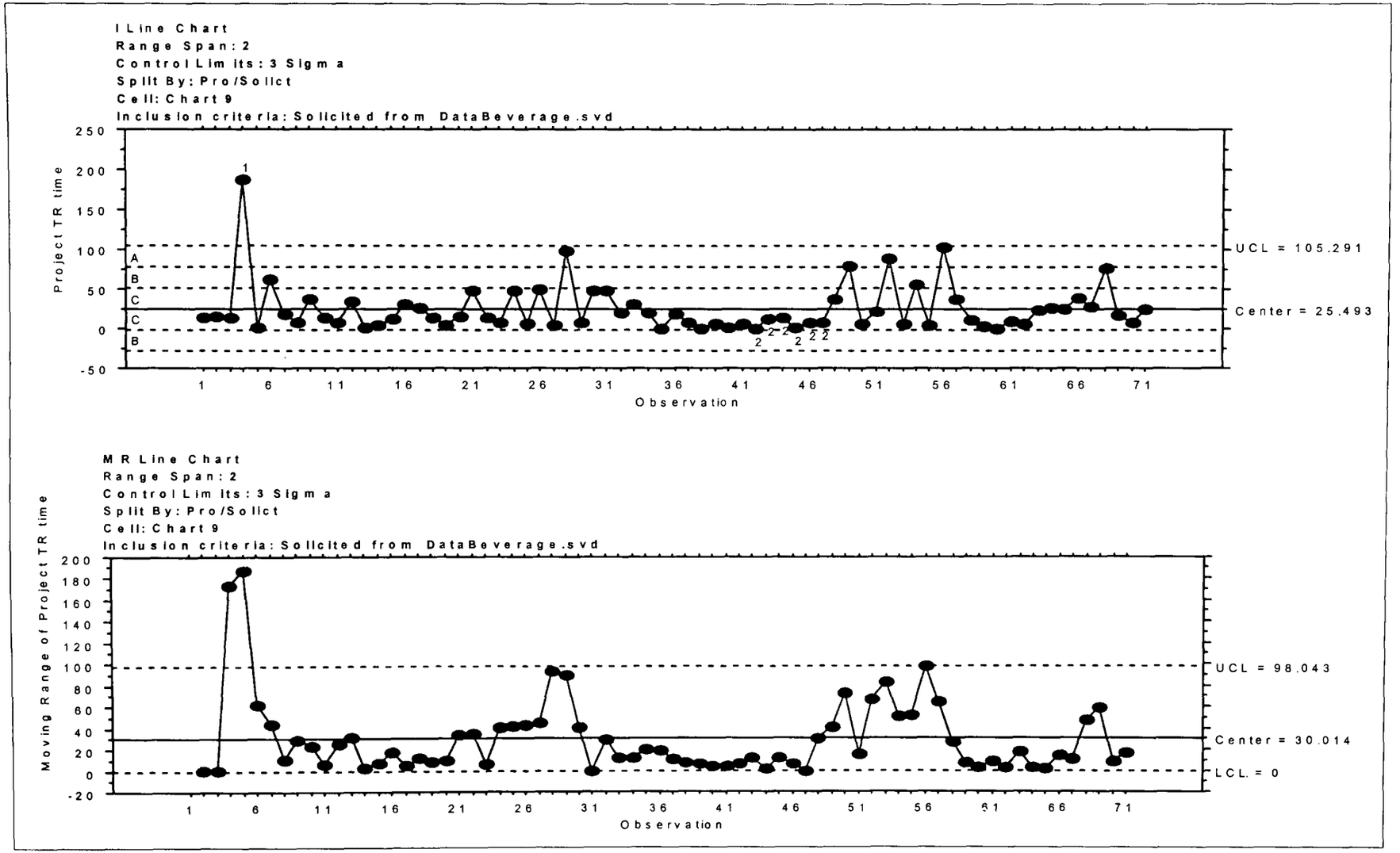

I Line Chart
Range Span: 2
Control Limits: 3 Sigma
Split By: Pro/Solict
Cell: Chart 4
Inclusion criteria: Solicited from DataBeverage.svd
Project TR time
Observation
UCL = 102.49
Center = 29.718
LCL = -43.054
MR Line Chart
Range Span: 2
Control Limits: 3 Sigma
Split By: Pro/Solict
Cell: Chart 4
Inclusion criteria: Solicited from DataBeverage.svd
Moving Range of Project TR time
Observation
UCL = 89.41
Center = 27.371
LCL = 0

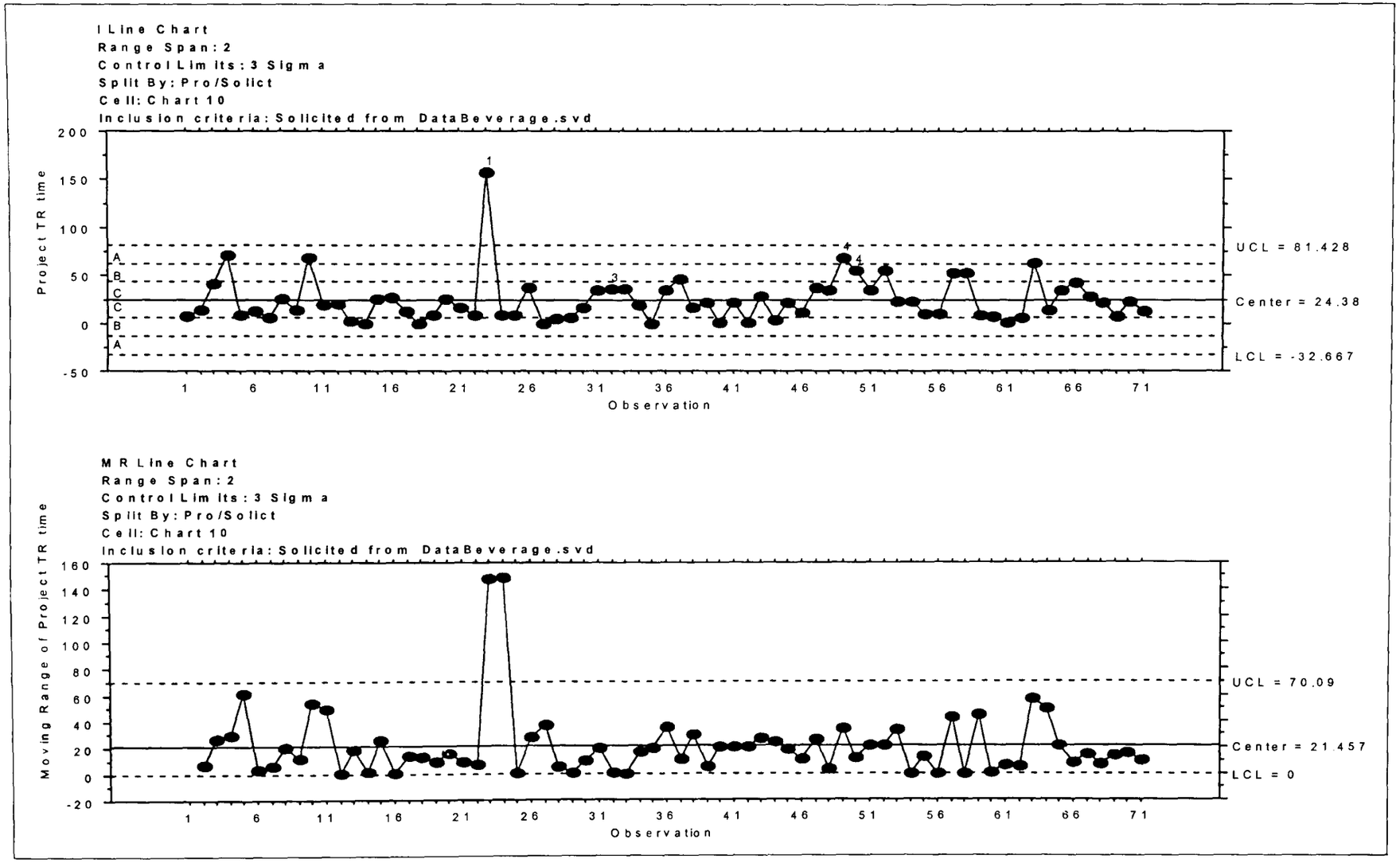

I Line Chart
Range Span: 2
Control Limits: 3 Sigma
Split By: Pro/Solict
Cell: Chart 5
Inclusion criteria: Solicited from DataBeverage.svd
Project TR time
Observation
UCL = 133.933
Center = 28.535
M R Line Chart
Range Span: 2
Control Limits: 3 Sigma
Split By: Pro/Solict
Cell: Chart 5
Inclusion criteria: Solicited from DataBeverage.svd
Moving Range of Project TR time
Observation
UCL = 129.495
Center = 39.643
LCL = 0

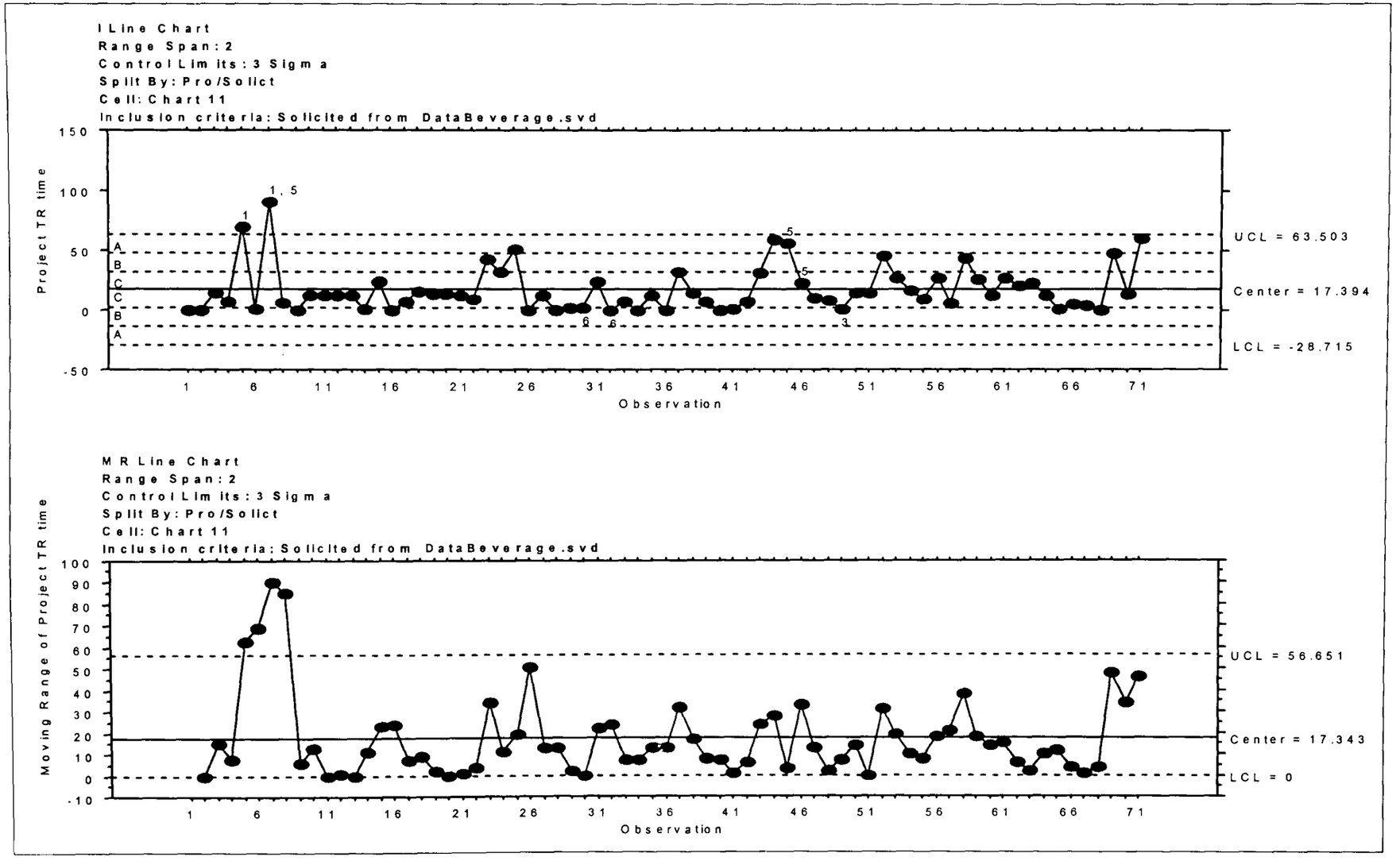

I Line Chart
Range Span: 2
Control Limits: 3 Sigma
Split By: Pro/Solict
Cell: Chart 6
Inclusion criteria: Solicited from DataBeverage.svd
Project TR time
150
100
50
0
-50
A
B
C
C
B
A
UCL = 78.823
Center = 21.282
LCL = -36.26
1
6
11
16
21
26
31
36
41
46
51
56
61
66
71
Observation
MR Line Chart
Range Span: 2
Control Limits: 3 Sigma
Split By: Pro/Solict
Cell: Chart 6
Inclusion criteria: Solicited from DataBeverage.svd
Moving Range of Project TR time
120
100
80
60
40
20
0
-20
UCL = 70.697
Center = 21.643
LCL = 0
1
6
11
16
21
26
31
36
41
46
51
56
61
66
71
Observation

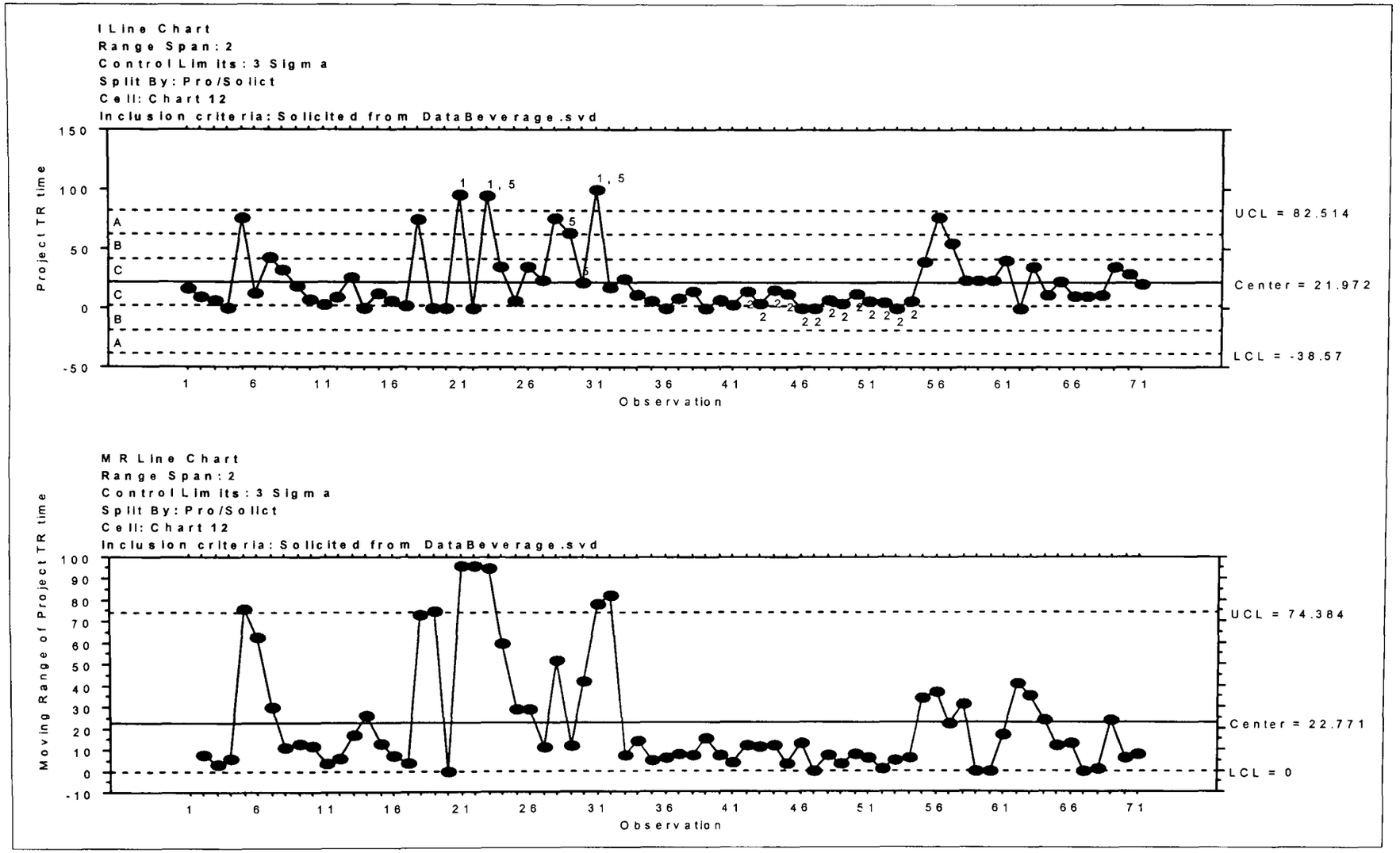

I Line Chart
Range Span: 2
Control Limits: 3 Sigma
Split By: Pro/Solict
Cell: Chart 7
Inclusion criteria: Solicited from DataBeverage.svd
Project TR time
300
250
200
150
100
50
0
-50
A
B
C
B
A
1, 5
2 2 2
2
1 6 11 16 21 26 31 36 41 46 51 56 61 66 71
Observation
UCL = 76.465
Center = 19
LCL = -38.465
MR Line Chart
Range Span: 2
Control Limits: 3 Sigma
Split By: Pro/Solict
Cell: Chart 7
Inclusion criteria: Solicited from DataBeverage.svd
Moving Range of Project TR time
300
250
200
150
100
50
0
-50
1 6 11 16 21 26 31 36 41 46 51 56 61 66 71
Observation
UCL = 70.604
Center = 21.614
LCL = 0

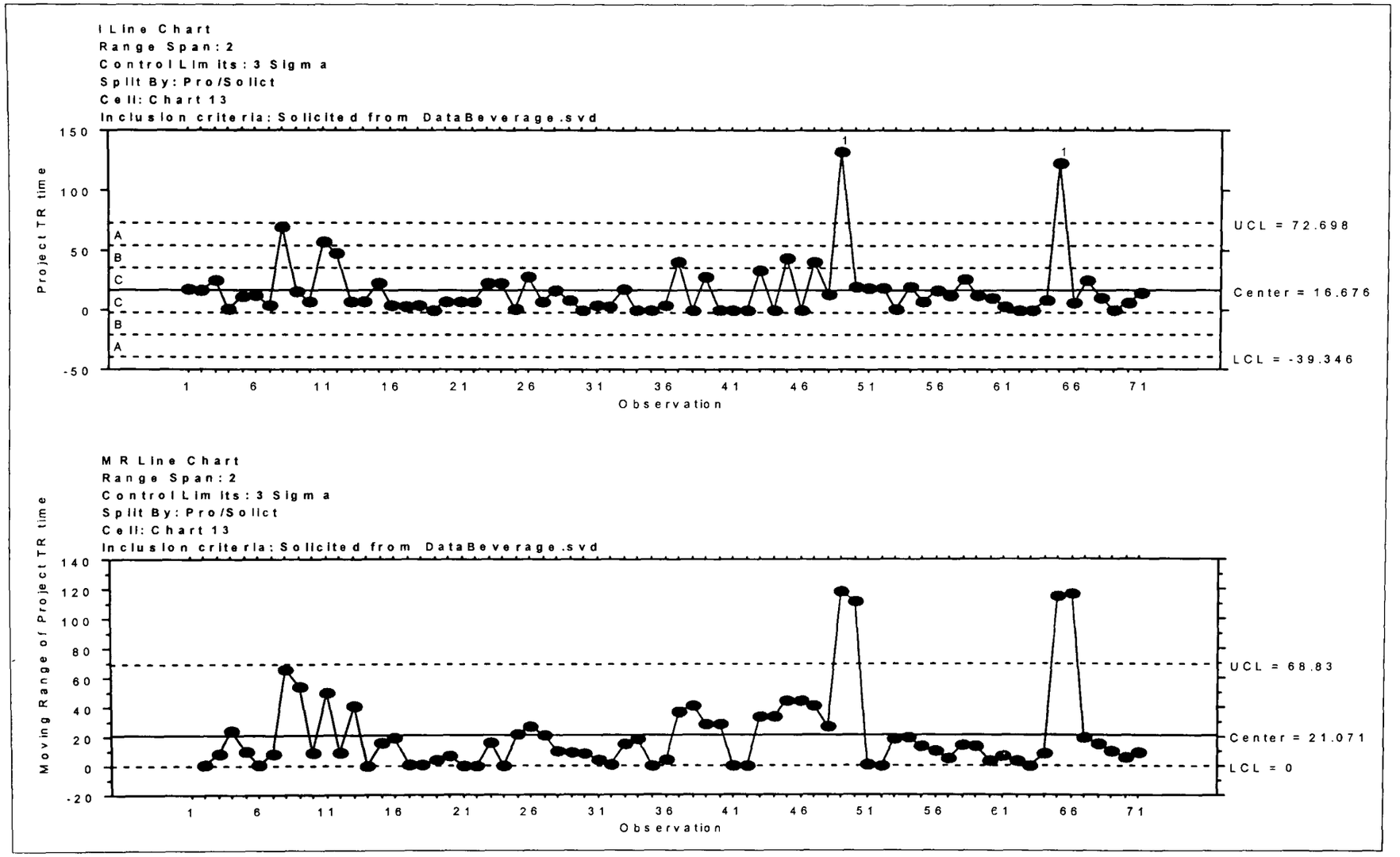

I Line Chart
Range Span: 2
Control Limits: 3 Sigma
Split By: Pro/Solict
Cell: Chart 8
Inclusion criteria: Solicited from DataBeverage.svd
Project TR time
Observation
UCL = 133.759
Center = 31.324
MR Line Chart
Range Span: 2
Control Limits: 3 Sigma
Split By: Pro/Solict
Cell: Chart 8
Inclusion criteria: Solicited from DataBeverage.svd
Moving Range of Project TR time
Observation
UCL = 125.855
Center = 38.529
LCL = 0

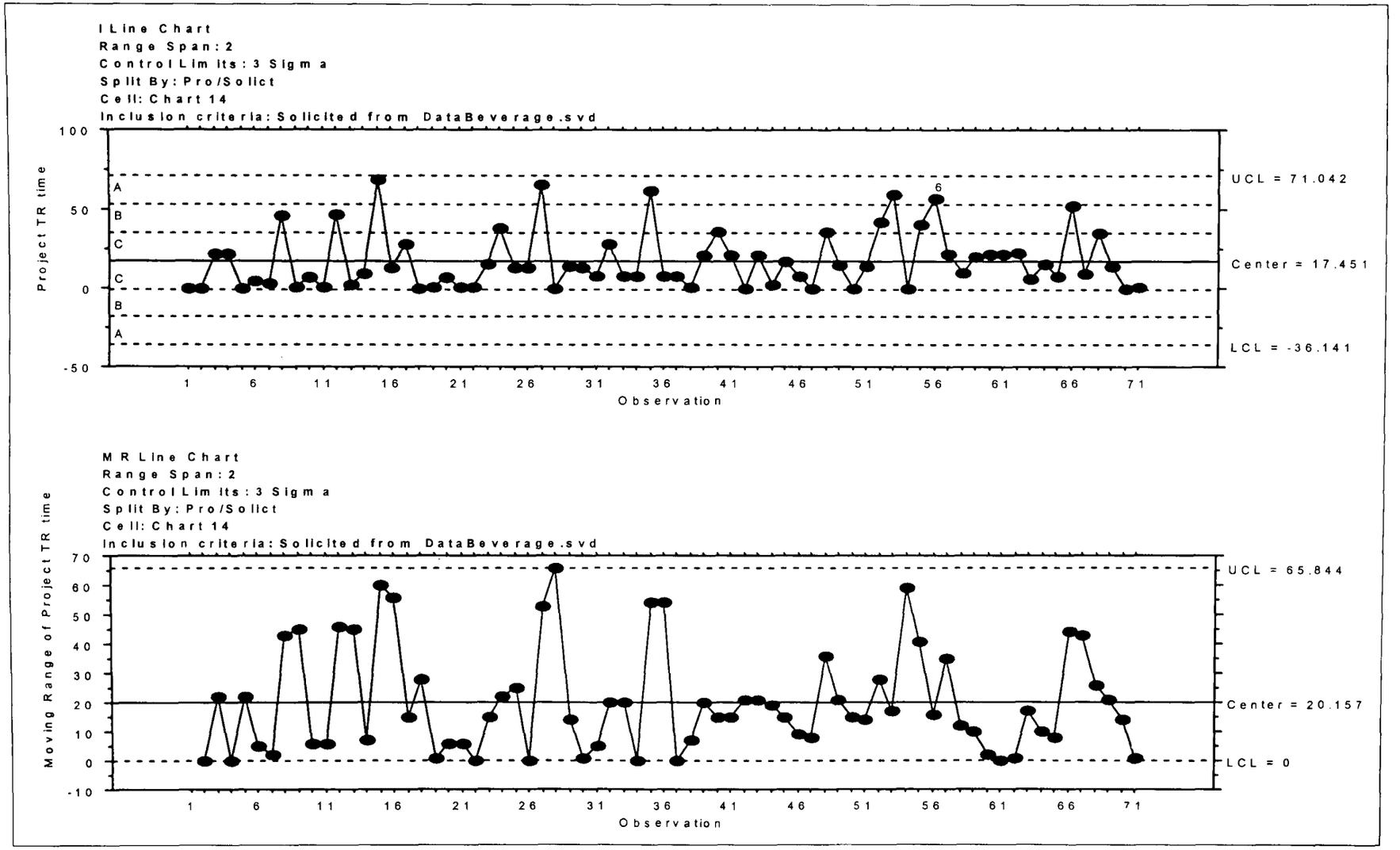

I Line Chart
Range Span: 2
Control Limits: 3 Sigma
Split By: Pro/Solict
Cell: Chart 9
Inclusion criteria: Solicited from DataBeverage.svd
Project TR time
250
200
150
100
50
0
-50
A
B
C
C
B
UCL = 105.291
Center = 25.493
1
2
1 6 11 16 21 26 31 36 41 46 51 56 61 66 71
Observation
MR Line Chart
Range Span: 2
Control Limits: 3 Sigma
Split By: Pro/Solict
Cell: Chart 9
Inclusion criteria: Solicited from DataBeverage.svd
Moving Range of Project TR time
200
180
160
140
120
100
80
60
40
20
0
-20
UCL = 98.043
Center = 30.014
LCL = 0
1 6 11 16 21 26 31 36 41 46 51 56 61 66 71
Observation

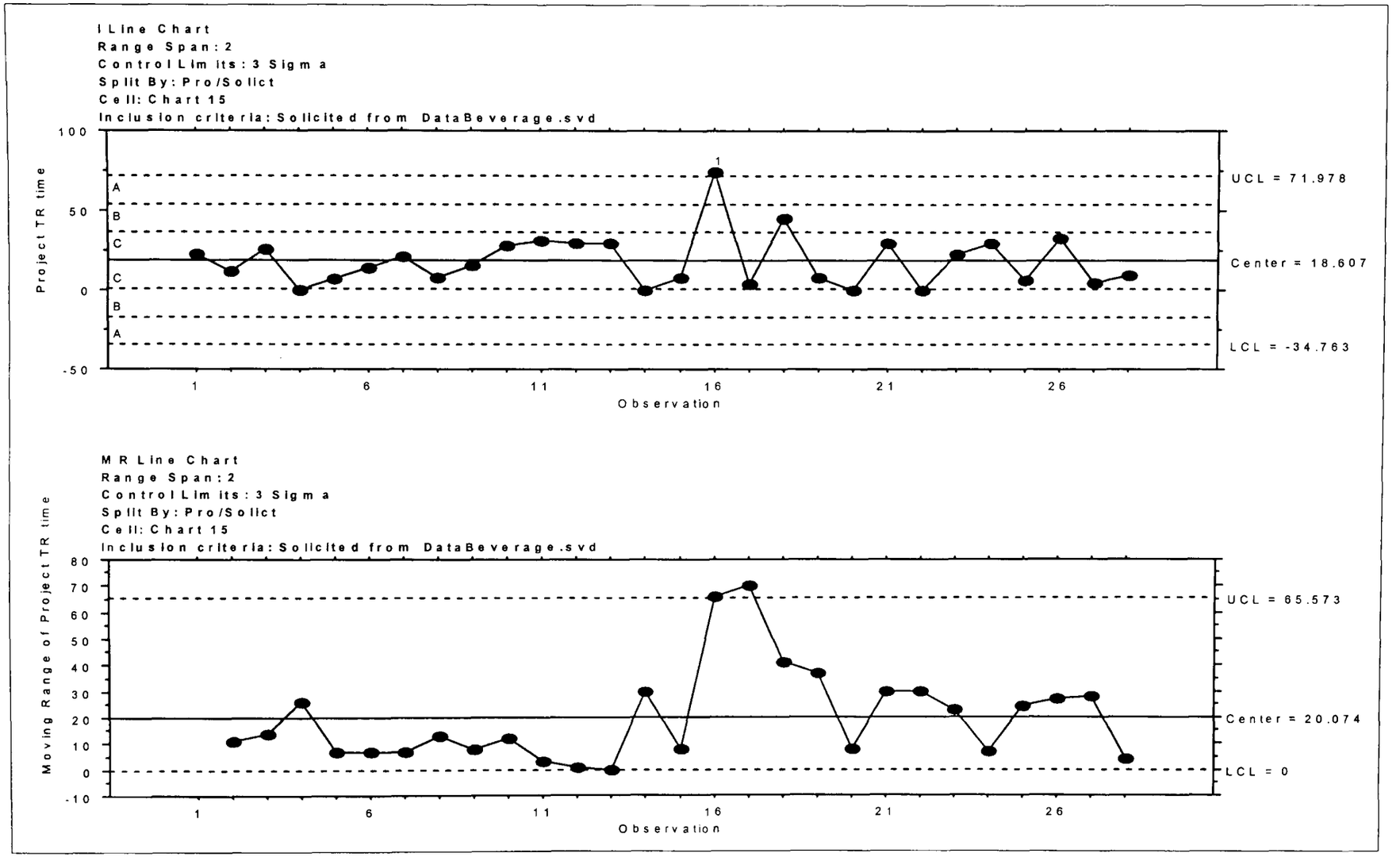

I Line Chart
Range Span: 2
Control Limits: 3 Sigma
Split By: Pro/Solict
Cell: Chart 10
Inclusion criteria: Solicited from DataBeverage.svd
Project TR time
200
150
100
50
0
-50
A
B
C
C
B
A
UCL = 81.428
Center = 24.38
LCL = -32.667
1
6
11
16
21
26
31
36
41
46
51
56
61
66
71
Observation
MR Line Chart
Range Span: 2
Control Limits: 3 Sigma
Split By: Pro/Solict
Cell: Chart 10
Inclusion criteria: Solicited from DataBeverage.svd
Moving Range of Project TR time
160
140
120
100
80
60
40
20
0
-20
UCL = 70.09
Center = 21.457
LCL = 0
1
6
11
16
21
26
31
36
41
46
51
56
61
66
71
Observation


I Line Chart
Range Span: 2
Control Limits: 3 Sigma
Split By: Pro/Solict
Cell: Chart 11
Inclusion criteria: Solicited from DataBeverage.svd
Project TR time
150
100
50
0
-50
UCL = 63.503
Center = 17.394
LCL = -28.715
Observation
1
6
11
16
21
26
31
36
41
46
51
56
61
66
71
M R Line Chart
Range Span: 2
Control Limits: 3 Sigma
Split By: Pro/Solict
Cell: Chart 11
Inclusion criteria: Solicited from DataBeverage.svd
Moving Range of Project TR time
100
90
80
70
60
50
40
30
20
10
0
-10
UCL = 56.651
Center = 17.343
LCL = 0
Observation


I Line Chart
Range Span: 2
Control Limits: 3 Sigma
Split By: Pro/Solict
Cell: Chart 12
Inclusion criteria: Solicited from DataBeverage.svd
Project TR time
150
100
50
0
-50
A
B
C
C
B
A
UCL = 82.514
Center = 21.972
LCL = -38.57
1
6
11
16
21
26
31
36
41
46
51
56
61
66
71
Observation
MR Line Chart
Range Span: 2
Control Limits: 3 Sigma
Split By: Pro/Solict
Cell: Chart 12
Inclusion criteria: Solicited from DataBeverage.svd
Moving Range of Project TR time
100
90
80
70
60
50
40
30
20
10
0
-10
UCL = 74.384
Center = 22.771
LCL = 0
1
6
11
16
21
26
31
36
41
46
51
56
61
66
71
Observation


I Line Chart
Range Span: 2
Control Limits: 3 Sigma
Split By: Pro/Solict
Cell: Chart 13
Inclusion criteria: Solicited from DataBeverage.svd
Project TR time
150
100
50
0
-50
A
B
C
C
B
A
1
1
UCL = 72.698
Center = 16.676
LCL = -39.346
1 6 11 16 21 26 31 36 41 46 51 56 61 66 71
Observation
M R Line Chart
Range Span: 2
Control Limits: 3 Sigma
Split By: Pro/Solict
Cell: Chart 13
Inclusion criteria: Solicited from DataBeverage.svd
Moving Range of Project TR time
140
120
100
80
60
40
20
0
-20
UCL = 68.83
Center = 21.071
LCL = 0
1 6 11 16 21 26 31 36 41 46 51 56 61 66 71
Observation


I Line Chart
Range Span: 2
Control Limits: 3 Sigma
Split By: Pro/Solict
Cell: Chart 14
Inclusion criteria: Solicited from DataBeverage.svd
Project TR time
100
50
0
-50
A
B
C
C
B
A
6
UCL = 71.042
Center = 17.451
LCL = -36.141
1 6 11 16 21 26 31 36 41 46 51 56 61 66 71
Observation
M R Line Chart
Range Span: 2
Control Limits: 3 Sigma
Split By: Pro/Solict
Cell: Chart 14
Inclusion criteria: Solicited from DataBeverage.svd
Moving Range of Project TR time
70
60
50
40
30
20
10
0
-10
UCL = 65.844
Center = 20.157
LCL = 0
1 6 11 16 21 26 31 36 41 46 51 56 61 66 71
Observation

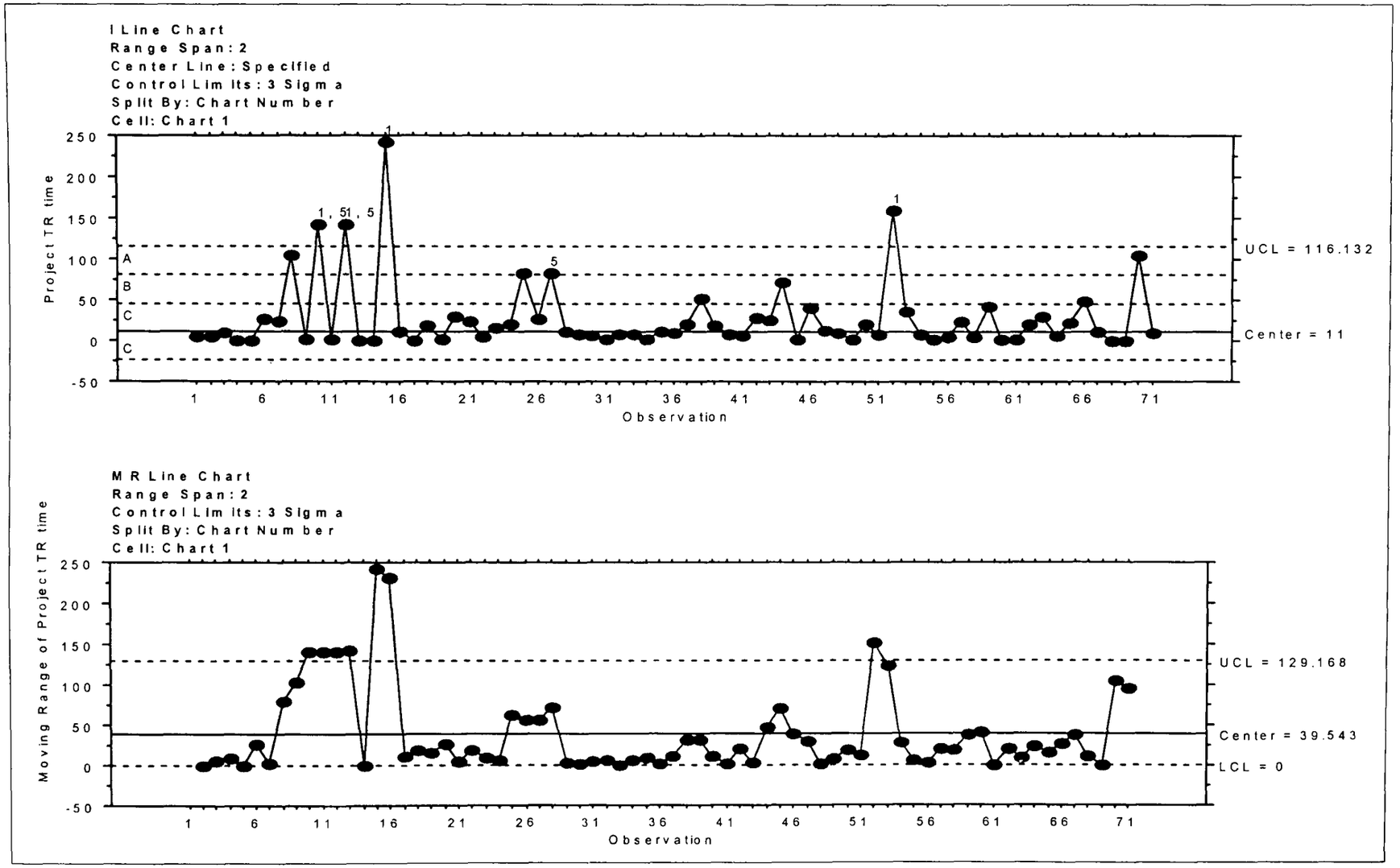

I Line Chart
Range Span: 2
Control Limits: 3 Sigma
Split By: Pro/Solict
Cell: Chart 15
Inclusion criteria: Solicited from DataBeverage.svd
Project TR time
100
50
0
-50
A
B
C
C
B
A
1
UCL = 71.978
Center = 18.607
LCL = -34.763
1
6
11
16
21
26
Observation
MR Line Chart
Range Span: 2
Control Limits: 3 Sigma
Split By: Pro/Solict
Cell: Chart 15
Inclusion criteria: Solicited from DataBeverage.svd
Moving Range of Project TR time
80
70
60
50
40
30
20
10
0
-10
UCL = 65.573
Center = 20.074
LCL = 0
1
6
11
16
21
26
Observation

Appendix 10

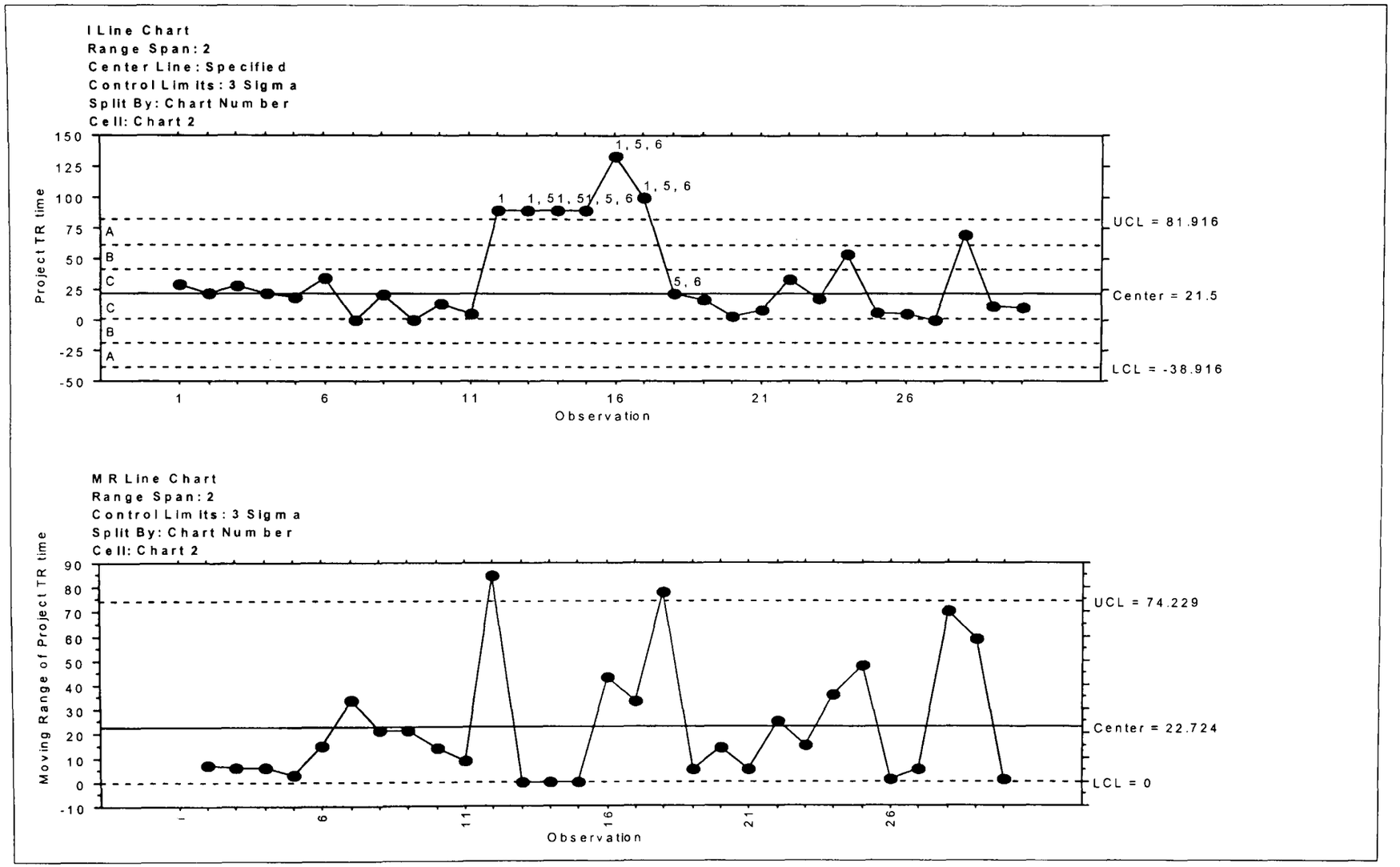
Control Charts for the Median Approach

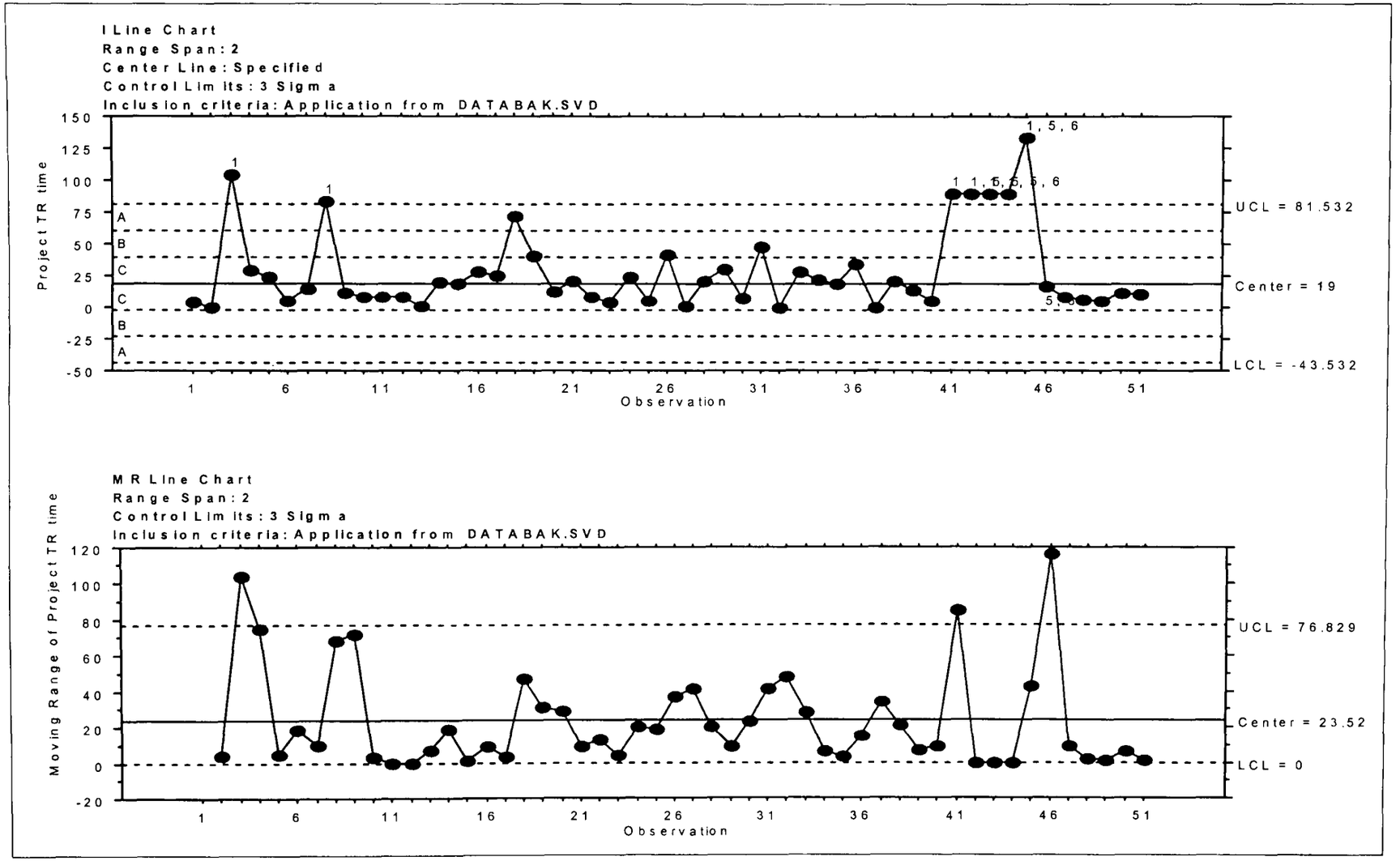
Bakery BU

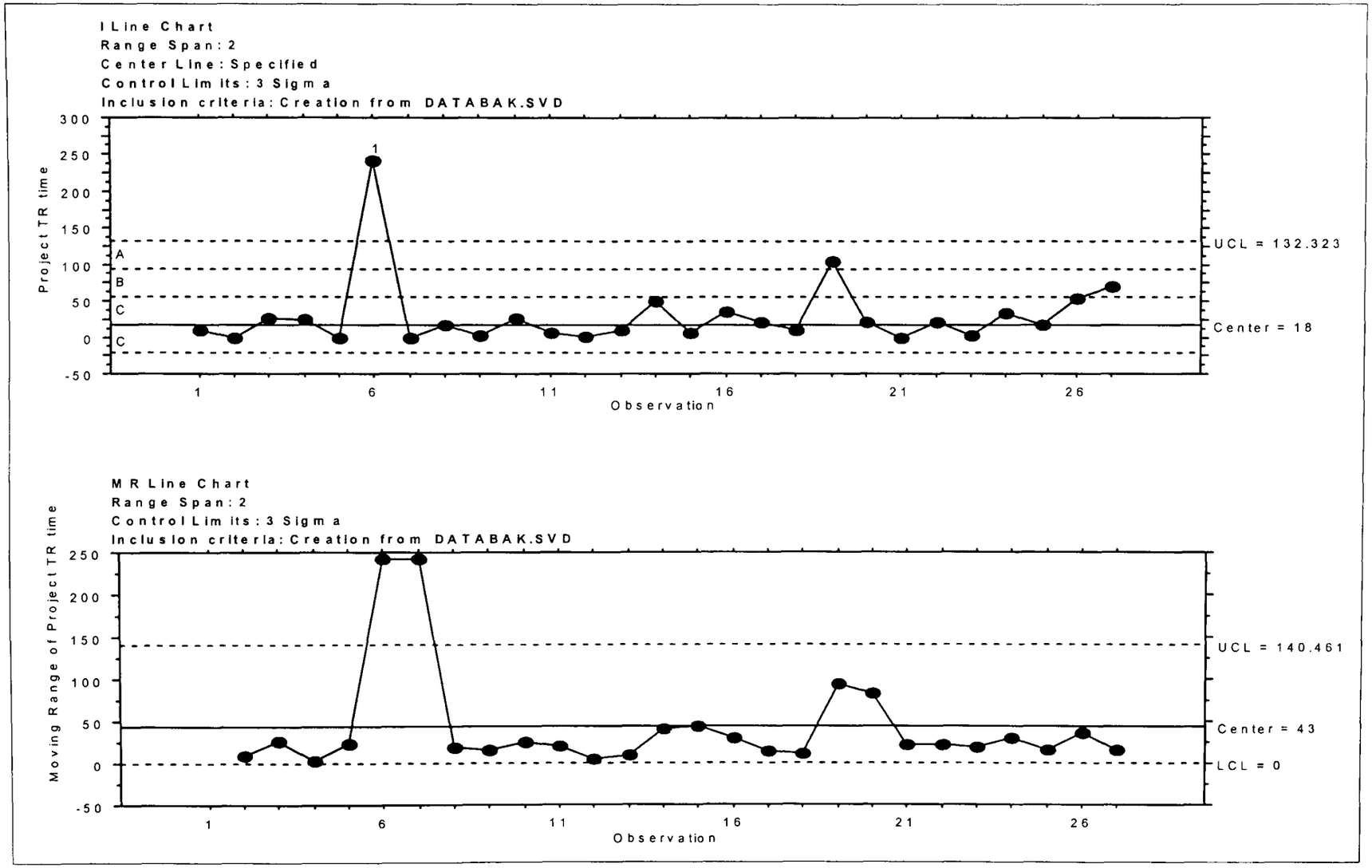
Bakery BU - All Projects

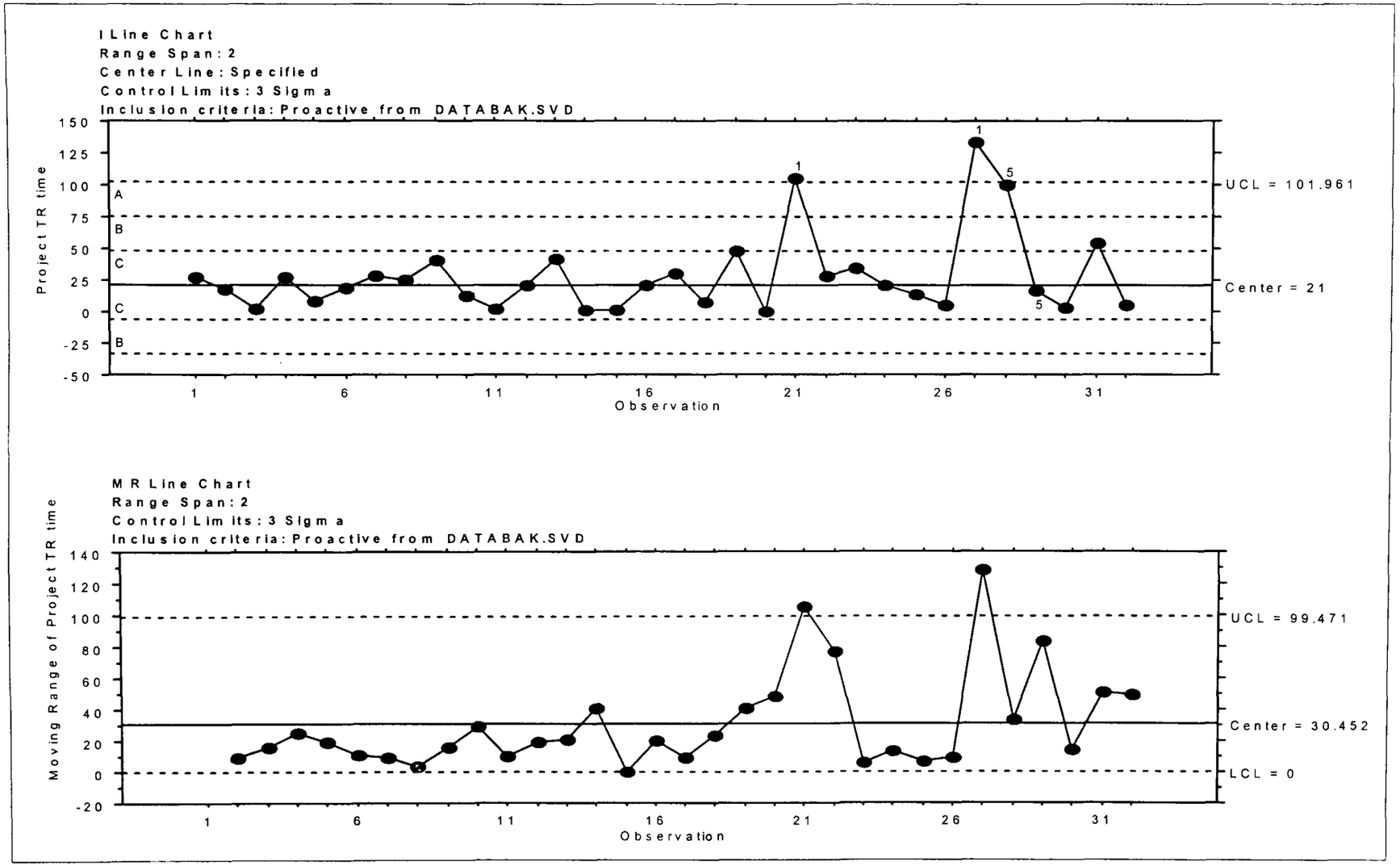


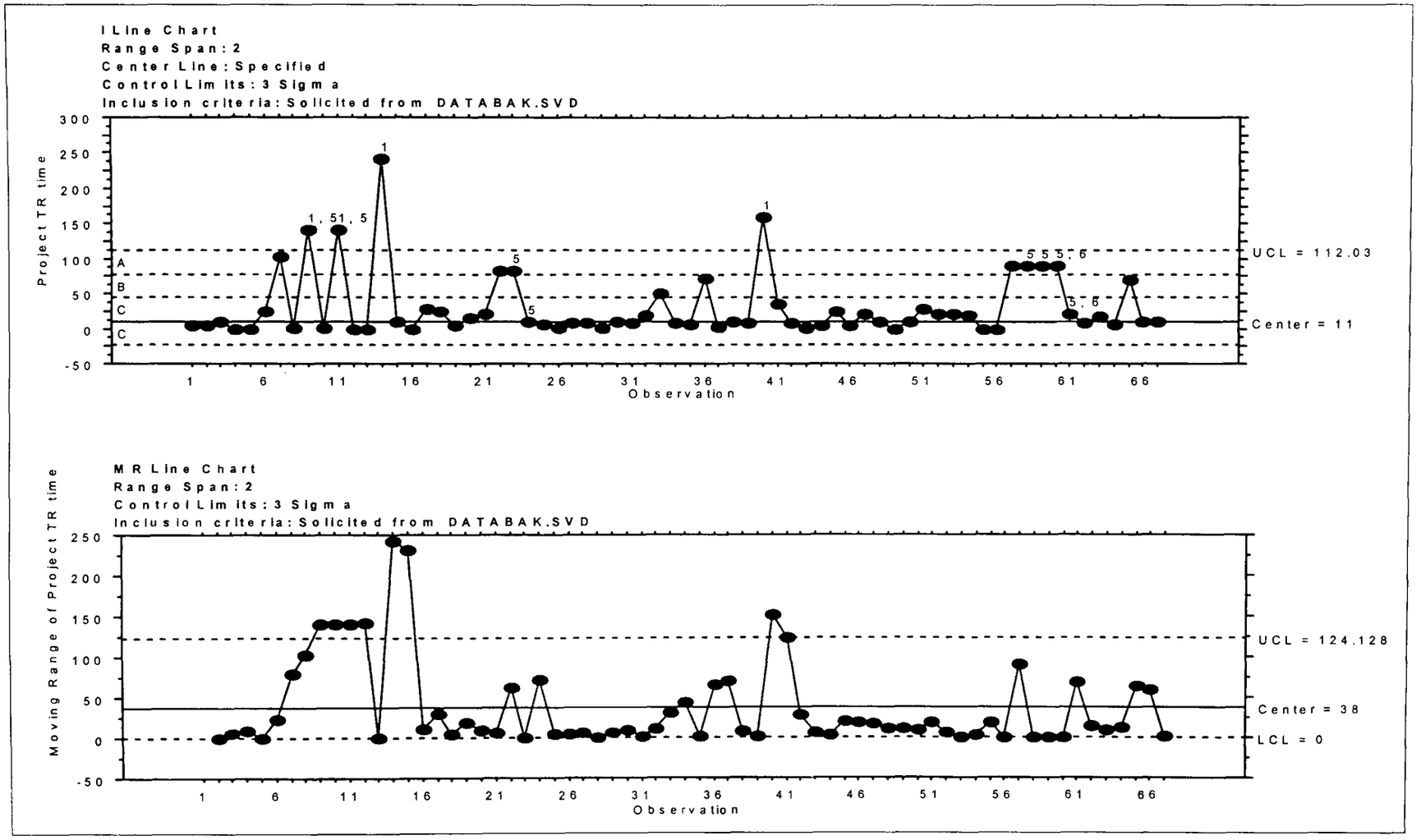
Bakery BU - All Projects




I Line Chart
Range Span: 2
Center Line: Specified
Control Limits: 3 Sigma
Inclusion criteria: Application from DATABAK.SVD
Project TR time
Observation
UCL = 81.532
Center = 19
LCL = -43.532
MR Line Chart
Range Span: 2
Control Limits: 3 Sigma
Inclusion criteria: Application from DATABAK.SVD
Moving Range of Project TR time
Observation
UCL = 76.829
Center = 23.52
LCL = 0


I Line Chart
Range Span: 2
Center Line: Specified
Control Limits: 3 Sigma
Inclusion criteria: Creation from DATABAK.SVD
Project TR time
300
250
200
150
100
50
0
-50
A
B
C
C
1
UCL = 132.323
Center = 18
1
6
11
16
21
26
Observation
MR Line Chart
Range Span: 2
Control Limits: 3 Sigma
Inclusion criteria: Creation from DATABAK.SVD
Moving Range of Project TR time
250
200
150
100
50
0
-50
UCL = 140.461
Center = 43
LCL = 0
1
6
11
16
21
26
Observation


I Line Chart
Range Span: 2
Center Line: Specified
Control Limits: 3 Sigma
Inclusion criteria: Proactive from DATABAK.SVD
Project TR time
150
125
100
75
50
25
0
-25
-50
A
B
C
C
B
1
1
5
5
UCL = 101.961
Center = 21
1
6
11
16
21
26
31
Observation
MR Line Chart
Range Span: 2
Control Limits: 3 Sigma
Inclusion criteria: Proactive from DATABAK.SVD
Moving Range of Project TR time
140
120
100
80
60
40
20
0
-20
UCL = 99.471
Center = 30.452
LCL = 0
1
6
11
16
21
26
31
Observation


I Line Chart
Range Span: 2
Center Line: Specified
Control Limits: 3 Sigma
Inclusion criteria: Solicited from DATABAK.SVD
Project TR time
Observation
UCL = 112.03
Center = 11
MR Line Chart
Range Span: 2
Control Limits: 3 Sigma
Inclusion criteria: Solicited from DATABAK.SVD
Moving Range of Project TR time
Observation
UCL = 124.128
Center = 38
LCL = 0

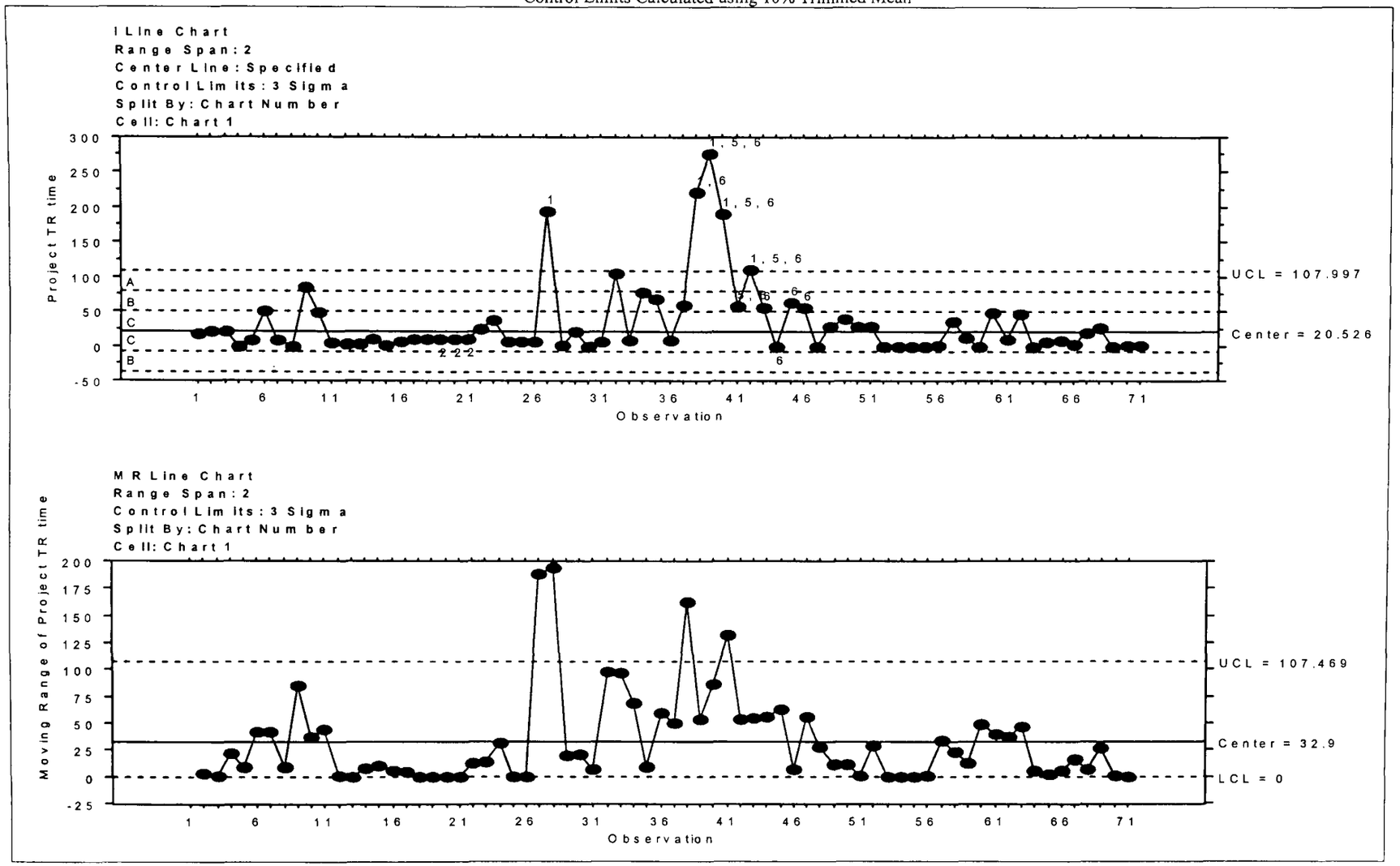
Appendix 11

Control Charts for the 10% Trimmed Mean Approach

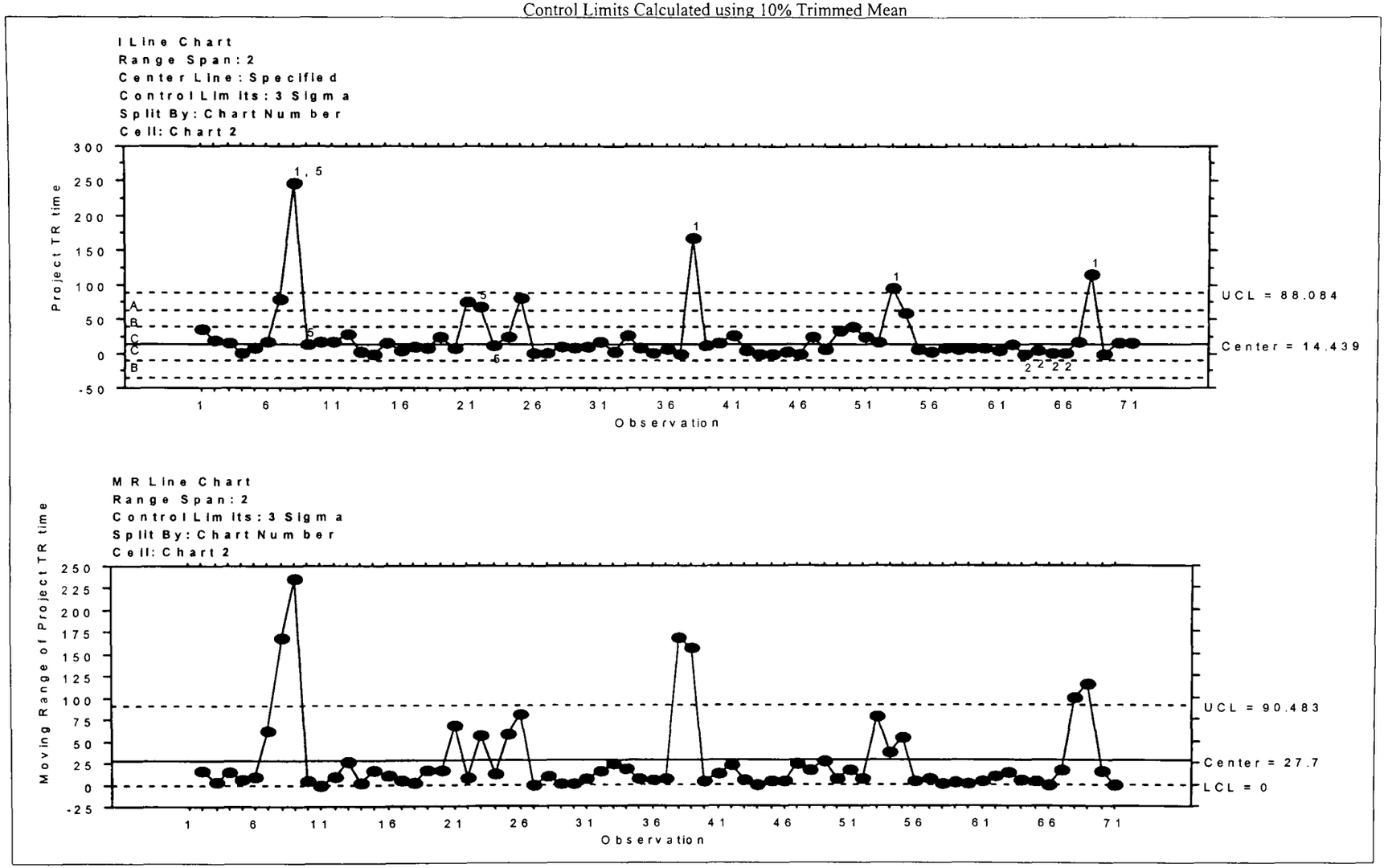
Confectionery BU

Confectionery BU	Page number
All Projects	128
Application projects	134
Collection projects	136
Creation projects	137
Proactive projects	138
Solicited projects	139

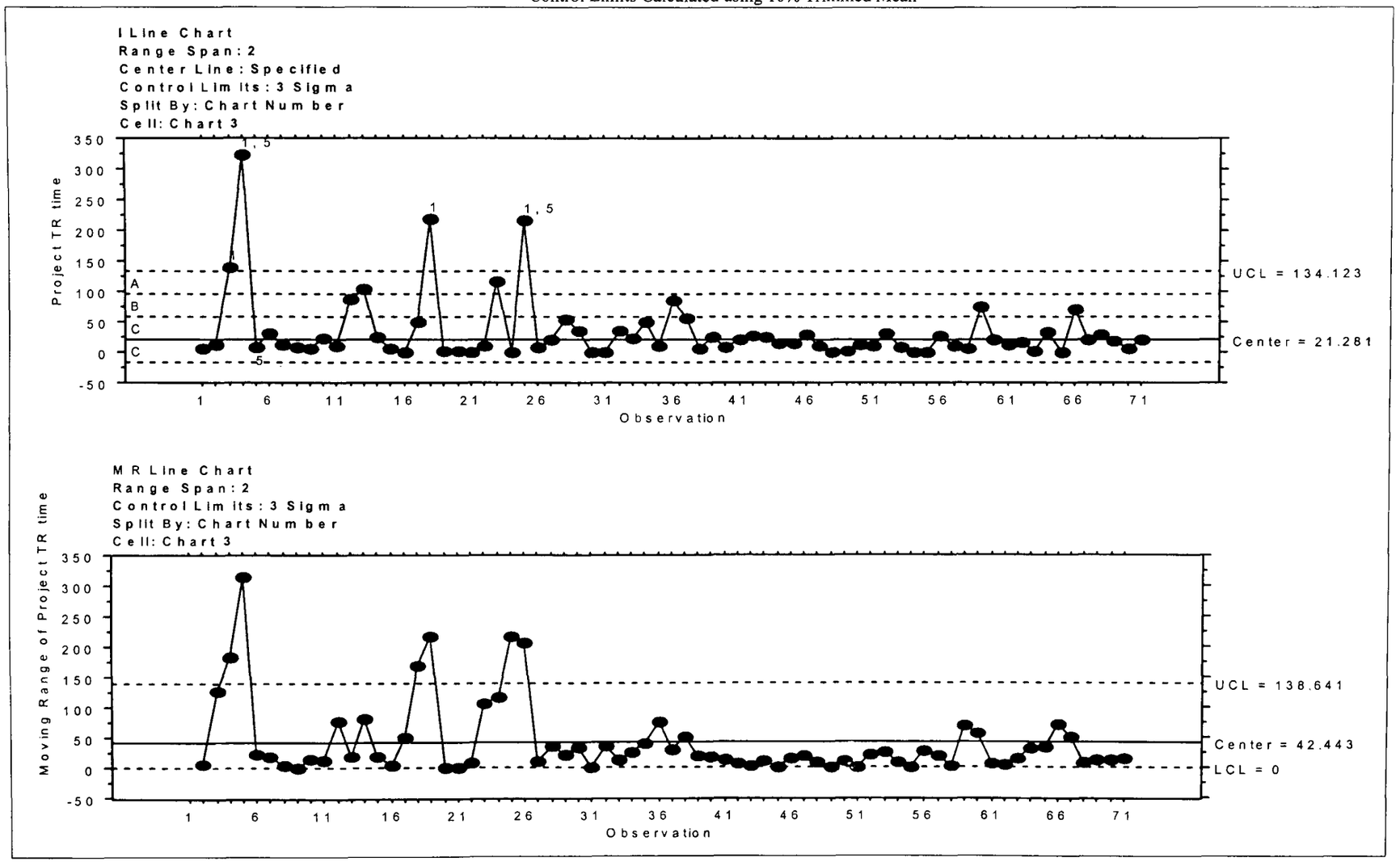
Confectionery BU - All Projects
Control Limits Calculated using 10% Trimmed Mean



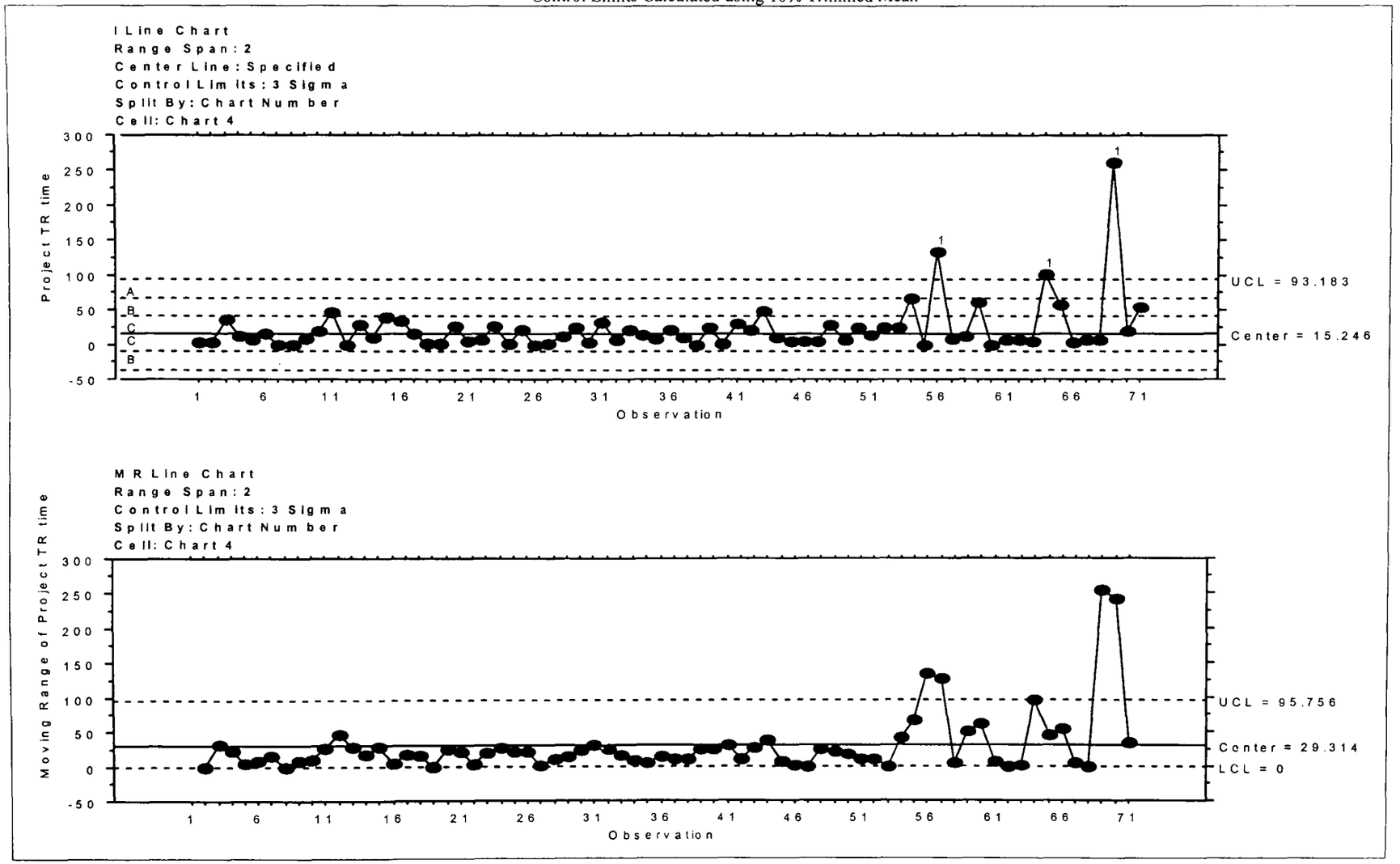
Confectionery BU - All Projects
Control Limits Calculated using 10% Trimmed Mean



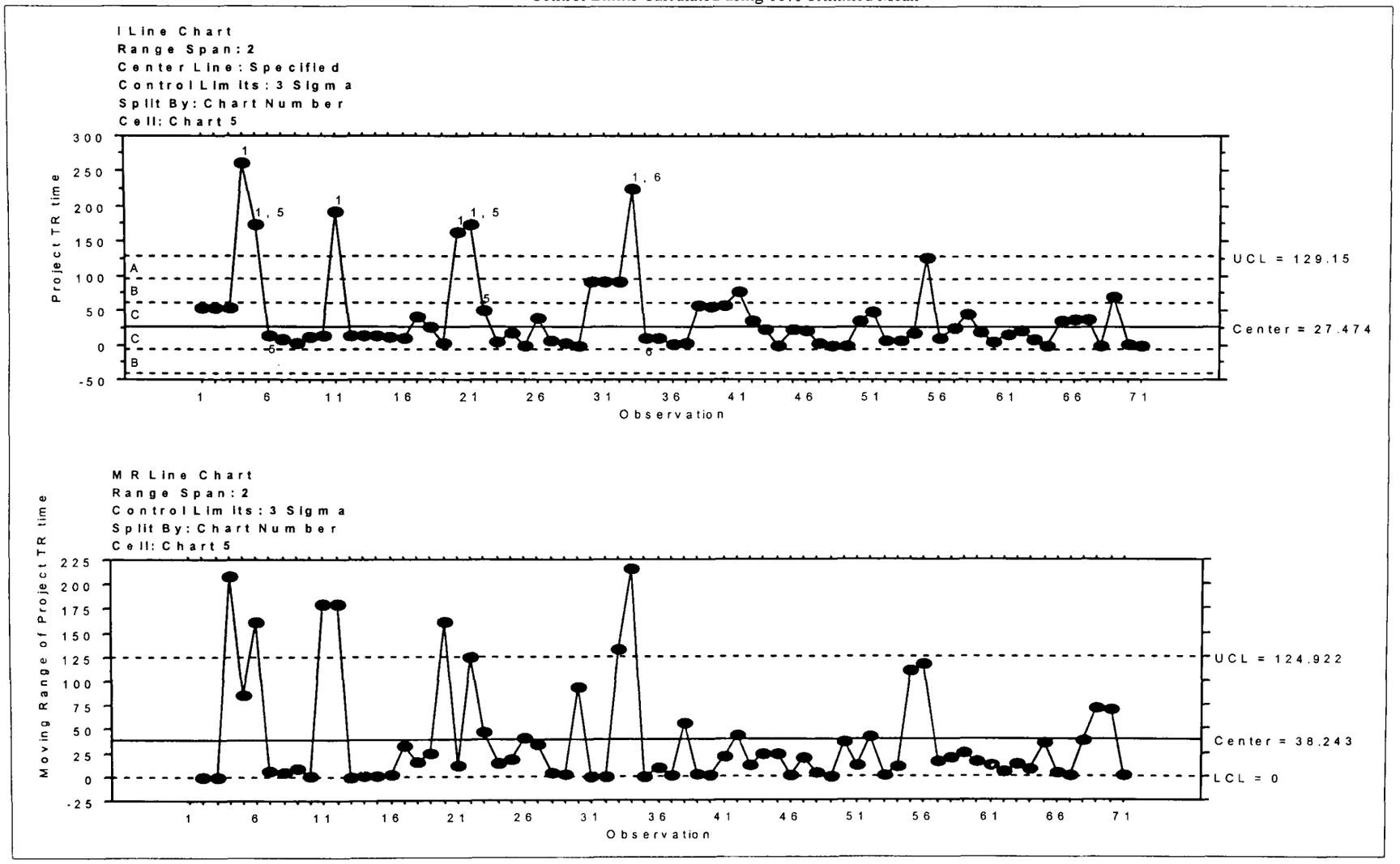
Confectionery BU - All Projects
Control Limits Calculated using 10% Trimmed Mean



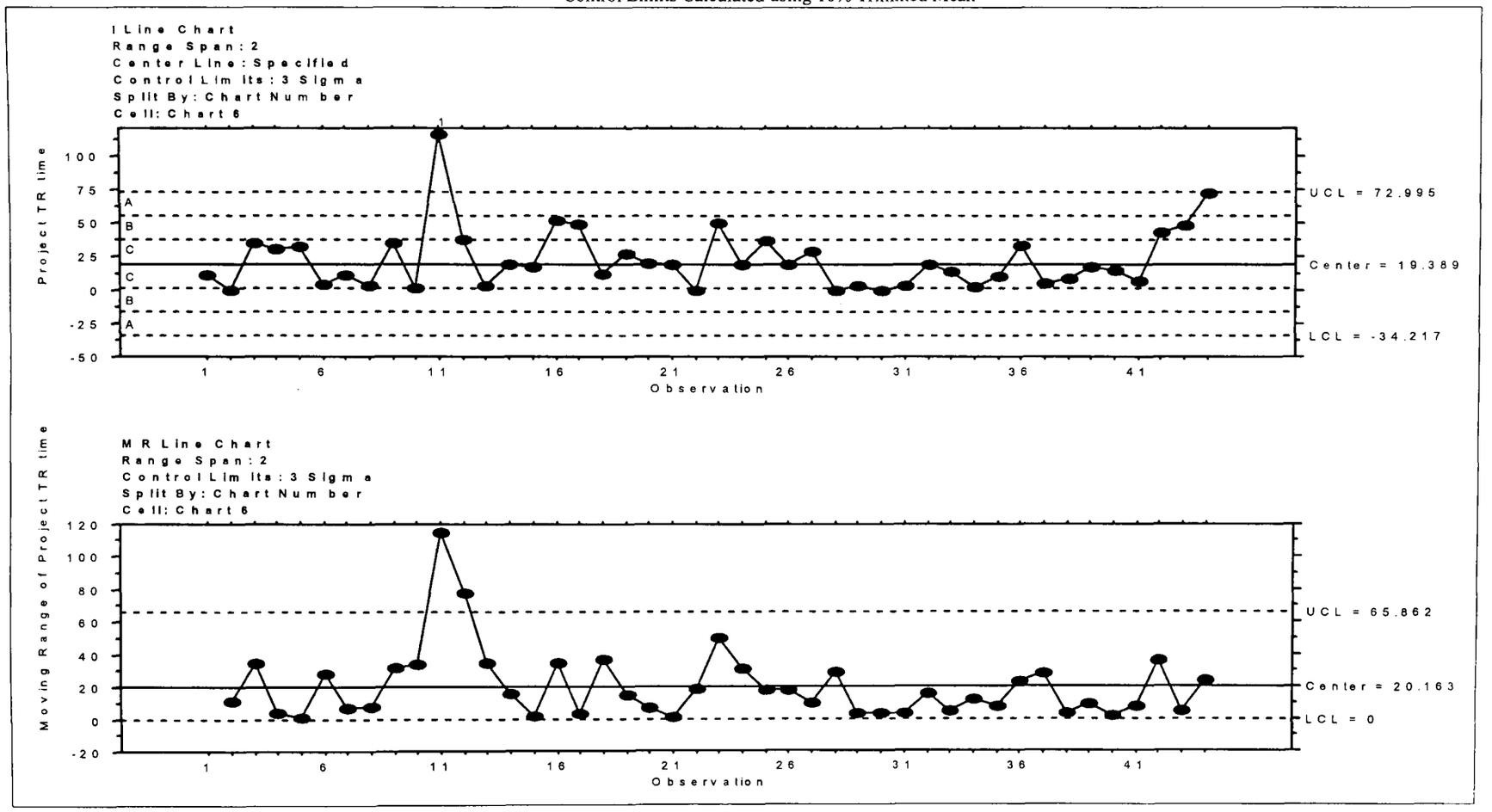
Confectionery BU - All Projects
Control Limits Calculated using 10% Trimmed Mean

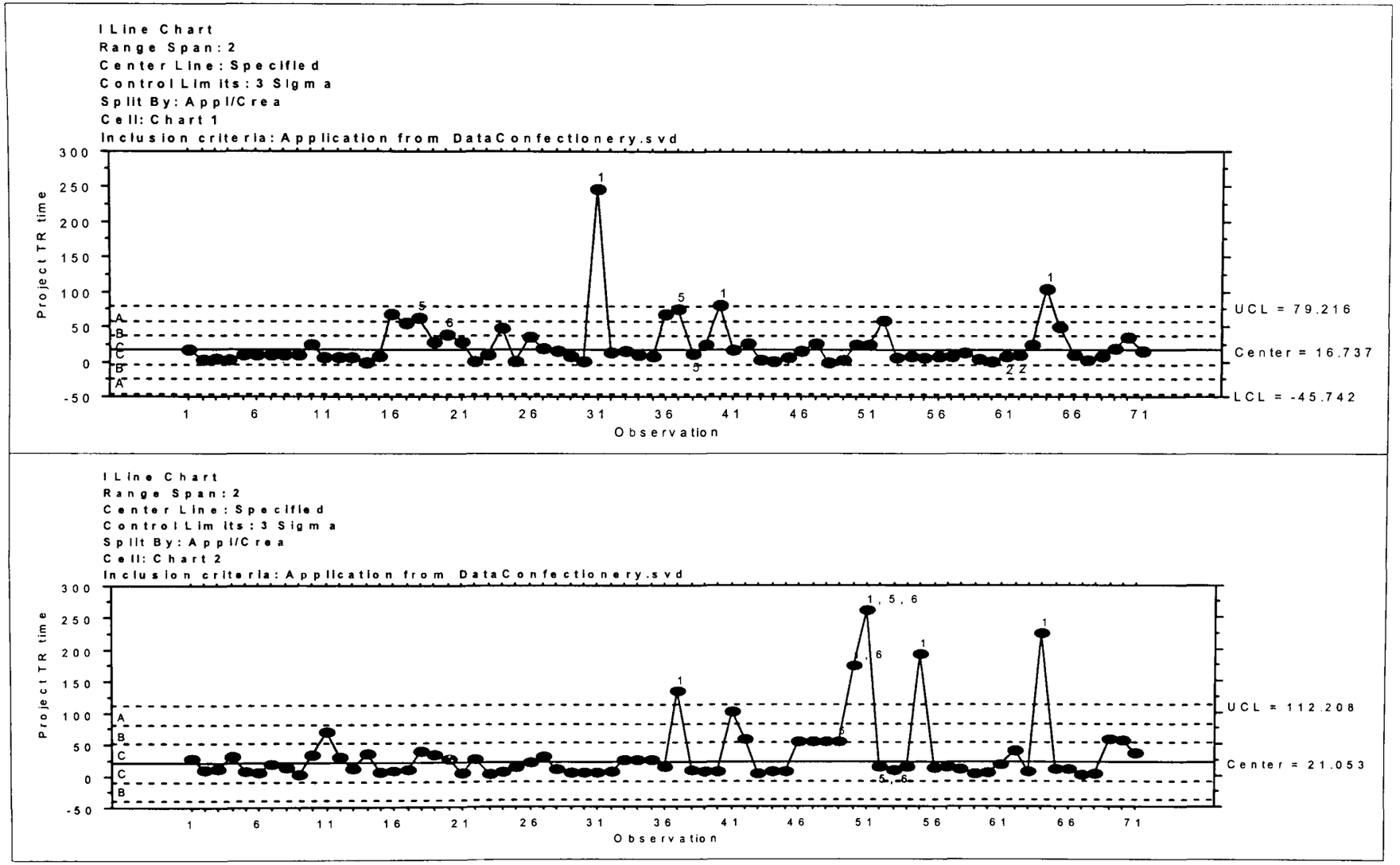


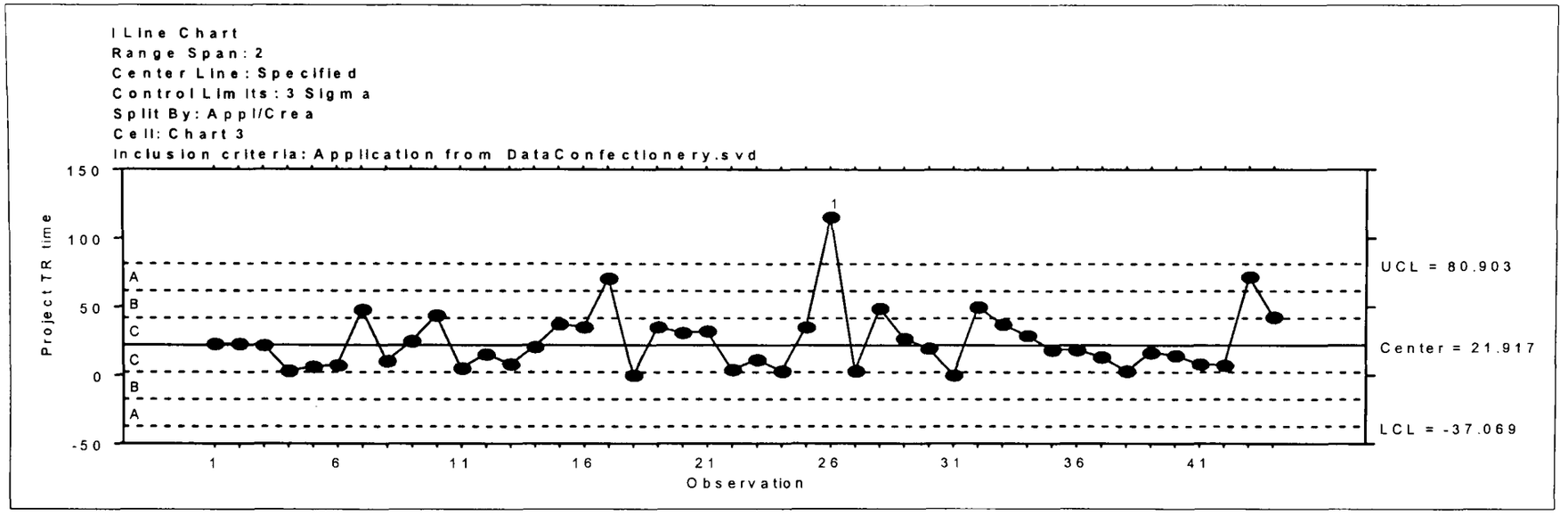
Confectionery BU - All Projects
Control Limits Calculated using 10% Trimmed Mean

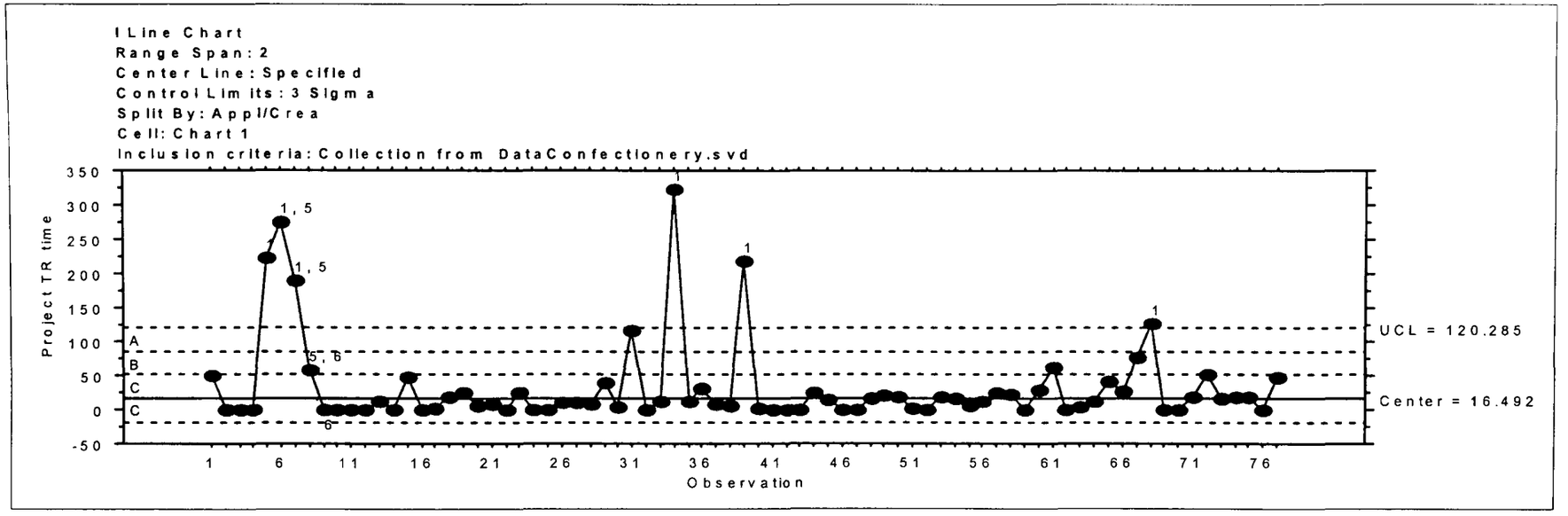


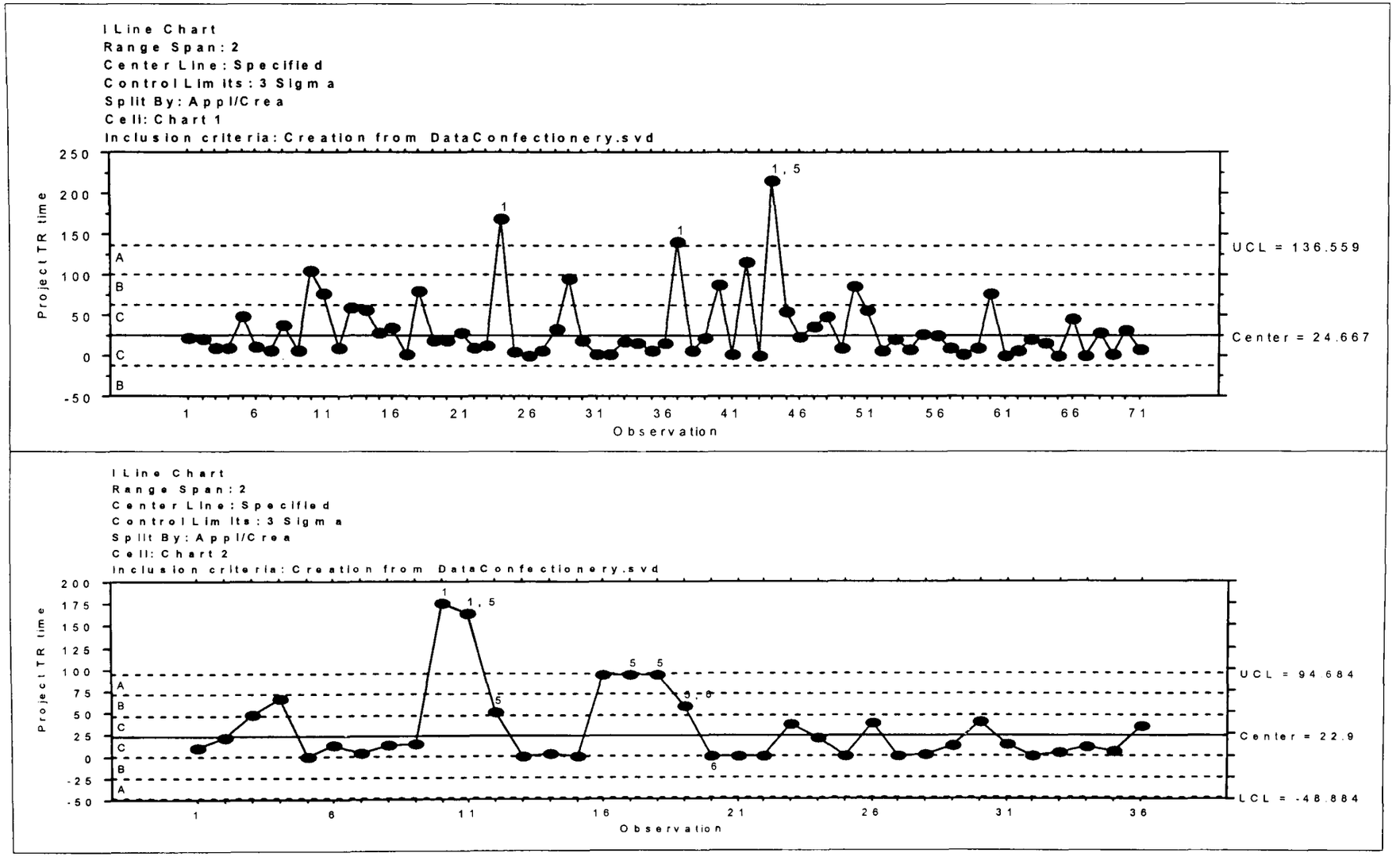
Confectionery BU - All Projects
Control Limits Calculated using 10% Trimmed Mean

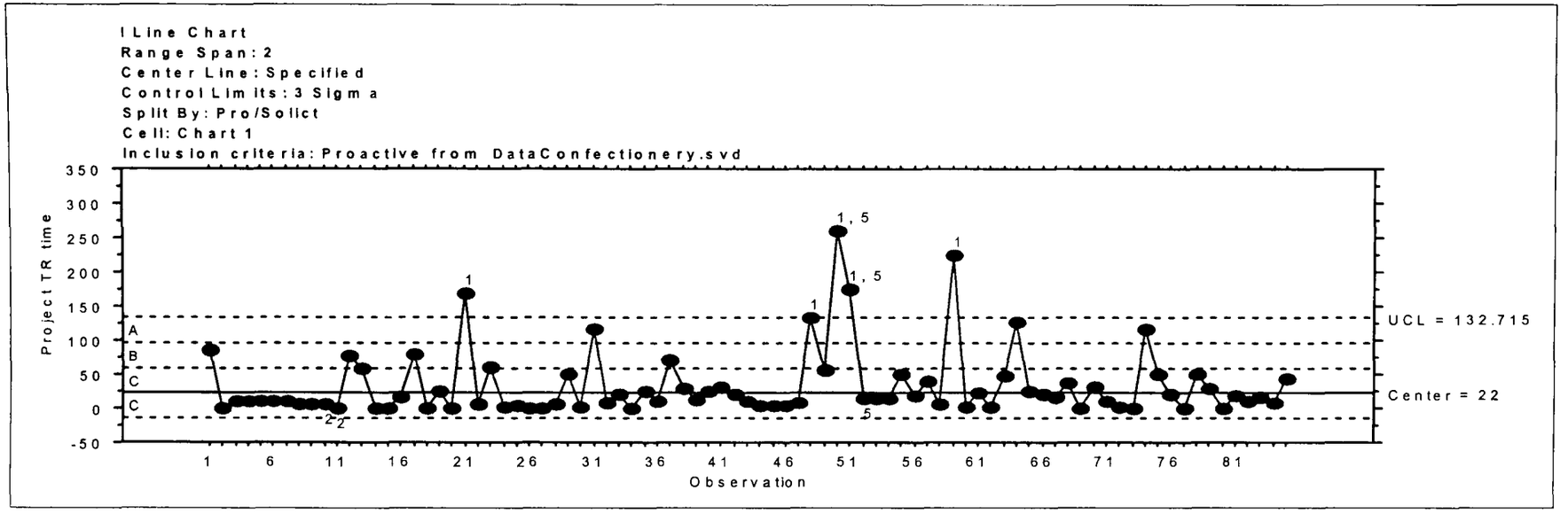


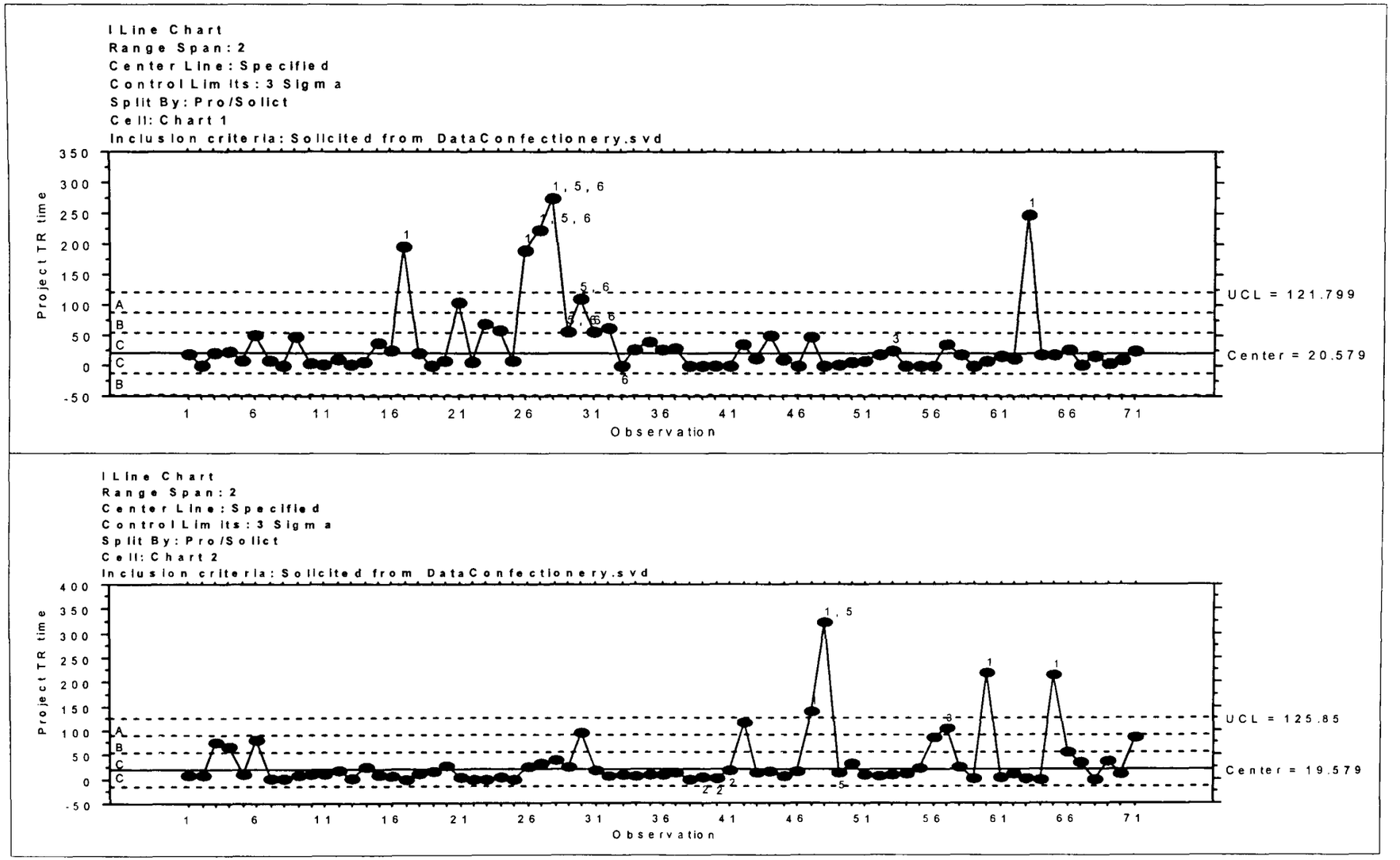

I Line Chart
Range Span: 2
Center Line: Specified
Control Limits: 3 Sigma
Split By: Appl/Crea
Cell: Chart 1
Inclusion criteria: Application from DataConfectionery.svd
Project TR time
Observation
UCL = 79.216
Center = 16.737
LCL = -45.742
I Line Chart
Range Span: 2
Center Line: Specified
Control Limits: 3 Sigma
Split By: Appl/Crea
Cell: Chart 2
Inclusion criteria: Application from DataConfectionery.svd
Project TR time
Observation
UCL = 112.208
Center = 21.053

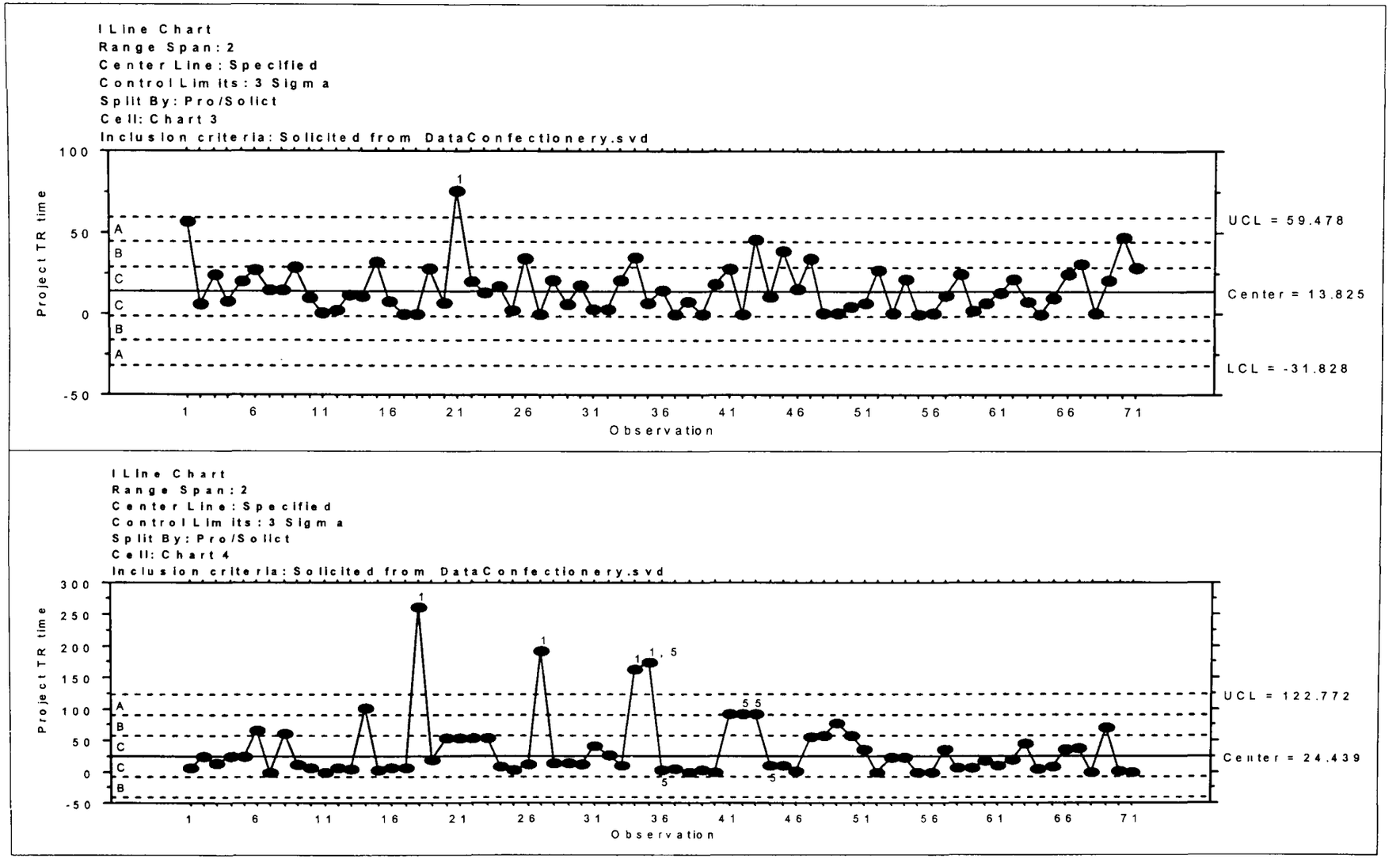

I Line Chart
Range Span: 2
Center Line: Specified
Control Limits: 3 Sigma
Split By: Appl/Crea
Cell: Chart 3
Inclusion criteria: Application from DataConfectionery.svd
Project TR time
150
100
50
0
-50
A
B
C
C
B
A
1
UCL = 80.903
Center = 21.917
LCL = -37.069
1
6
11
16
21
26
31
36
41
Observation

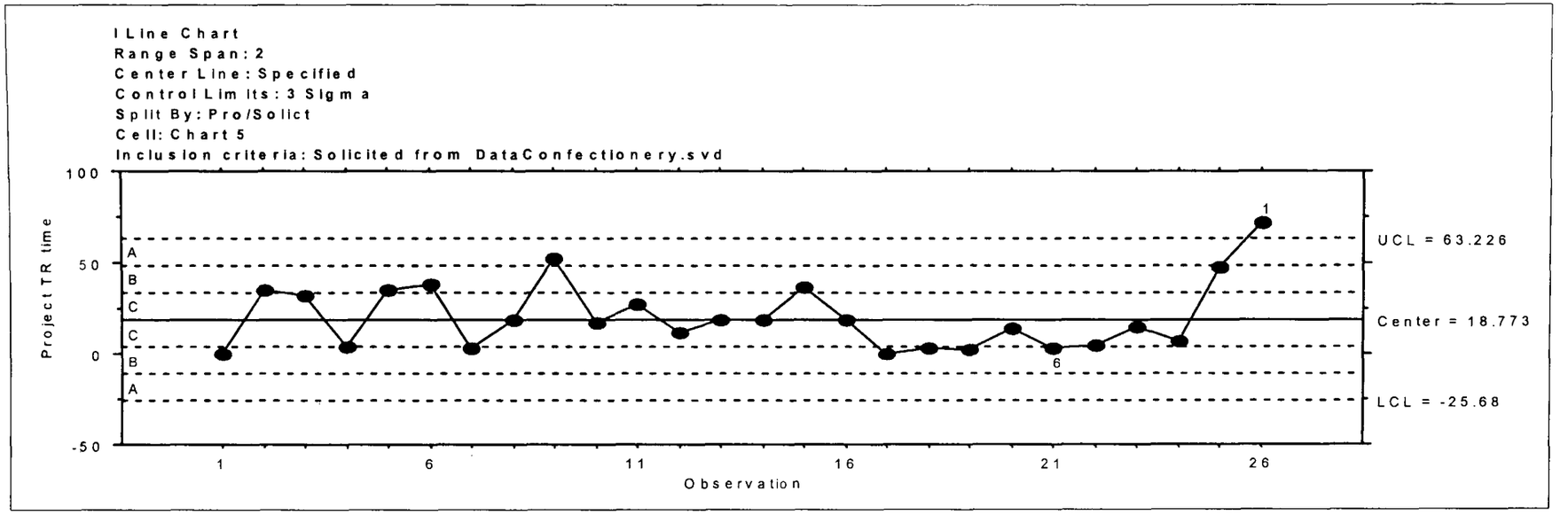

I Line Chart
Range Span: 2
Center Line: Specified
Control Limits: 3 Sigma
Split By: Appl/Crea
Cell: Chart 1
Inclusion criteria: Collection from DataConfectionery.svd
Project TR time
Observation
UCL = 120.285
Center = 16.492
A
B
C
C


I Line Chart
Range Span: 2
Center Line: Specified
Control Limits: 3 Sigma
Split By: Appl/Crea
Cell: Chart 1
Inclusion criteria: Creation from DataConfectionery.svd
Project TR time
Observation
UCL = 136.559
Center = 24.667
I Line Chart
Range Span: 2
Center Line: Specified
Control Limits: 3 Sigma
Split By: Appl/Crea
Cell: Chart 2
Inclusion criteria: Creation from DataConfectionery.svd
Project TR time
Observation
UCL = 94.684
Center = 22.9
LCL = -48.884


I Line Chart
Range Span: 2
Center Line: Specified
Control Limits: 3 Sigma
Split By: Pro/Solict
Cell: Chart 1
Inclusion criteria: Proactive from DataConfectionery.svd
Project TR time
350
300
250
200
150
100
50
0
-50
A
B
C
C
UCL = 132.715
Center = 22
1
6
11
16
21
26
31
36
41
46
51
56
61
66
71
76
81
Observation


I Line Chart
Range Span: 2
Center Line: Specified
Control Limits: 3 Sigma
Split By: Pro/Solict
Cell: Chart 1
Inclusion criteria: Solicited from DataConfectionery.svd
Project TR time
Observation
UCL = 121.799
Center = 20.579
I Line Chart
Range Span: 2
Center Line: Specified
Control Limits: 3 Sigma
Split By: Pro/Solict
Cell: Chart 2
Inclusion criteria: Solicited from DataConfectionery.svd
Project TR time
Observation
UCL = 125.85
Center = 19.579


I Line Chart
Range Span: 2
Center Line: Specified
Control Limits: 3 Sigma
Split By: Pro/Solict
Cell: Chart 3
Inclusion criteria: Solicited from DataConfectionery.svd
Project TR time
100
50
0
-50
A
B
C
C
B
A
UCL = 59.478
Center = 13.825
LCL = -31.828
1 6 11 16 21 26 31 36 41 46 51 56 61 66 71
Observation
I Line Chart
Range Span: 2
Center Line: Specified
Control Limits: 3 Sigma
Split By: Pro/Solict
Cell: Chart 4
Inclusion criteria: Solicited from DataConfectionery.svd
Project TR time
300
250
200
150
100
50
0
-50
A
B
C
C
B
UCL = 122.772
Center = 24.439
1 6 11 16 21 26 31 36 41 46 51 56 61 66 71
Observation

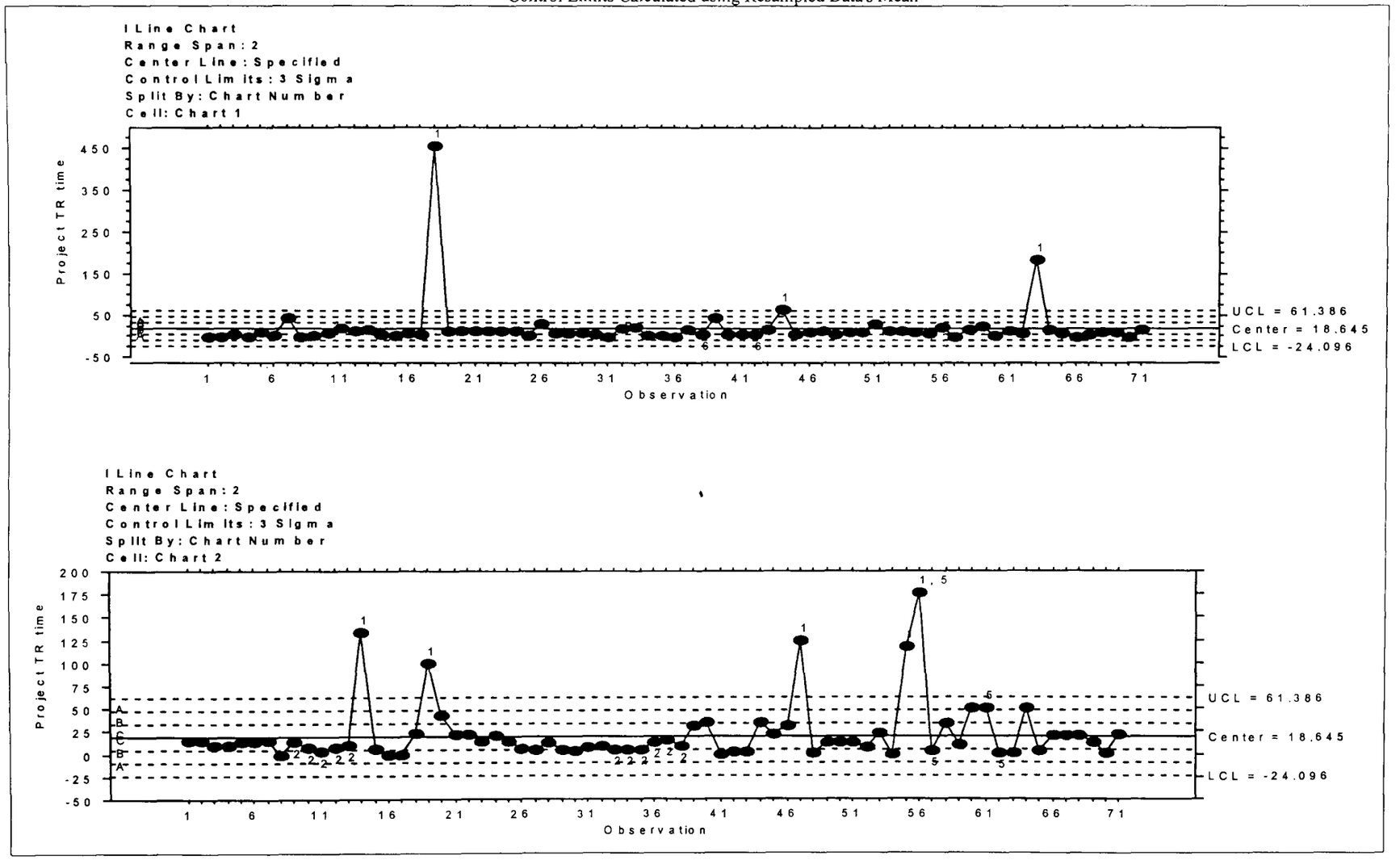

I Line Chart
Range Span: 2
Center Line: Specified
Control Limits: 3 Sigma
Split By: Pro/Solict
Cell: Chart 5
Inclusion criteria: Solicited from DataConfectionery.svd
Project TR time
100
50
0
-50
A
B
C
C
B
A
1
6
UCL = 63.226
Center = 18.773
LCL = -25.68
1
6
11
16
21
26
Observation

Appendix 12

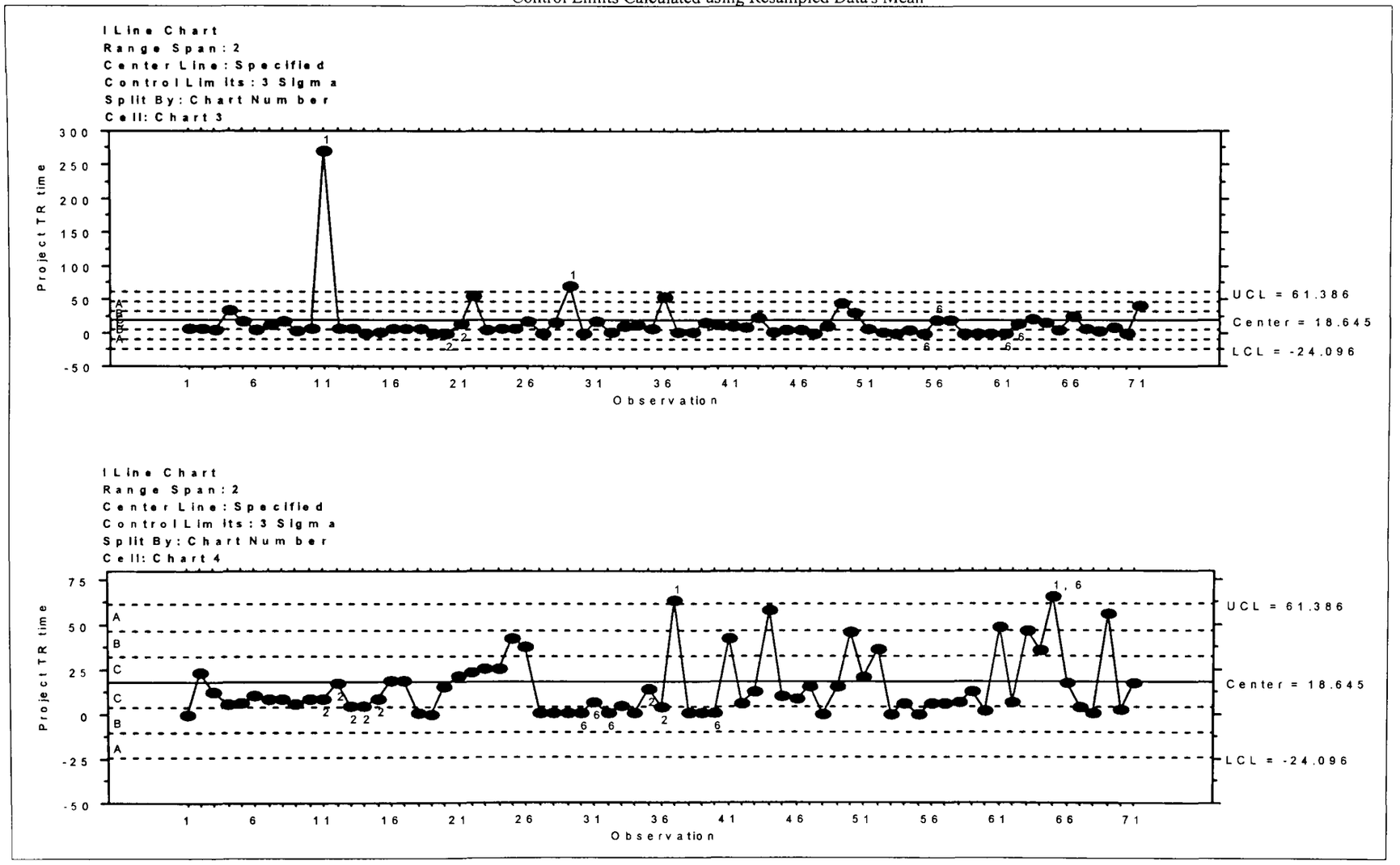
Control Charts for the Resampled Data's Mean

Dairy BU

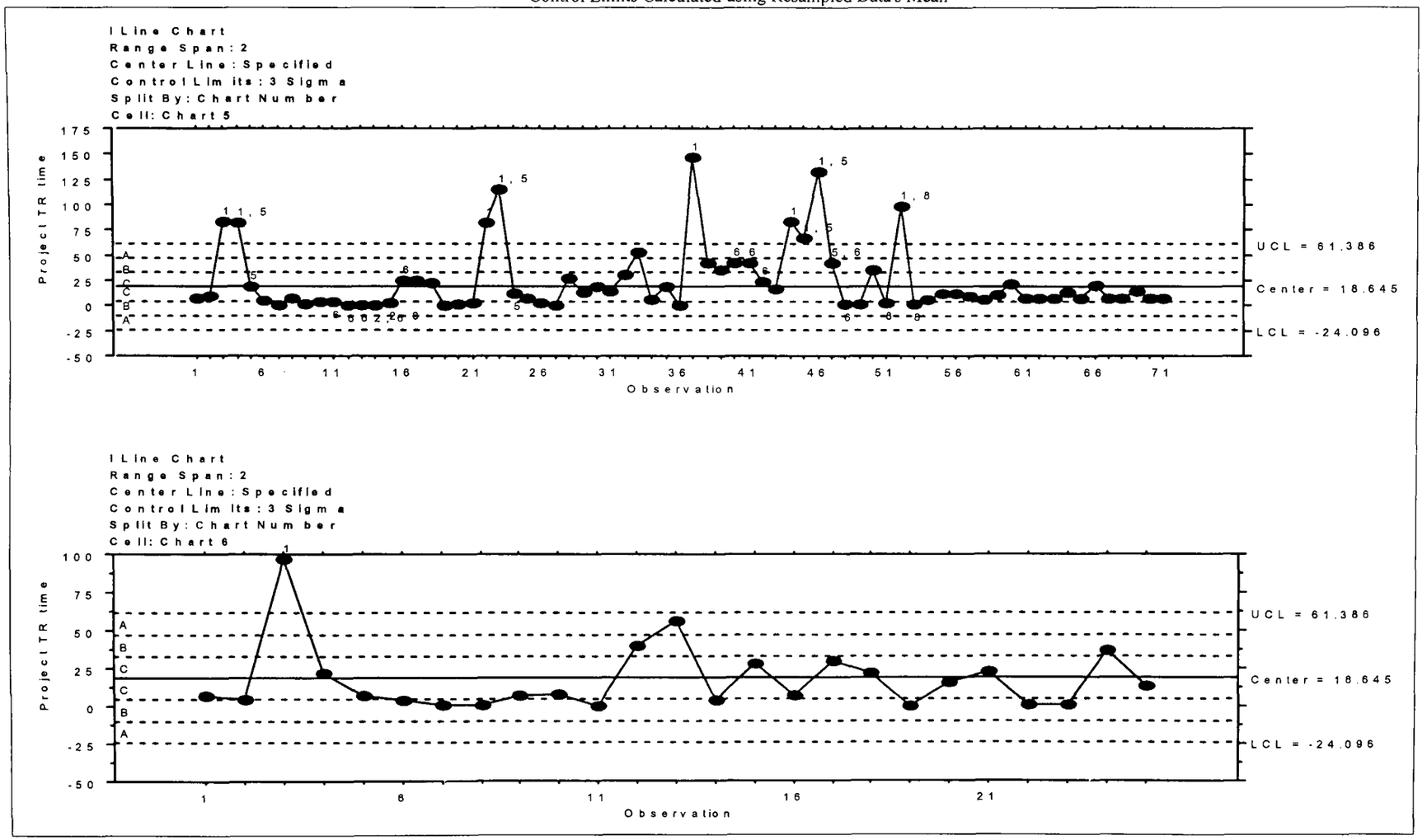
Dairy BU - All Projects
Control Limits Calculated using Resampled Data's Mean

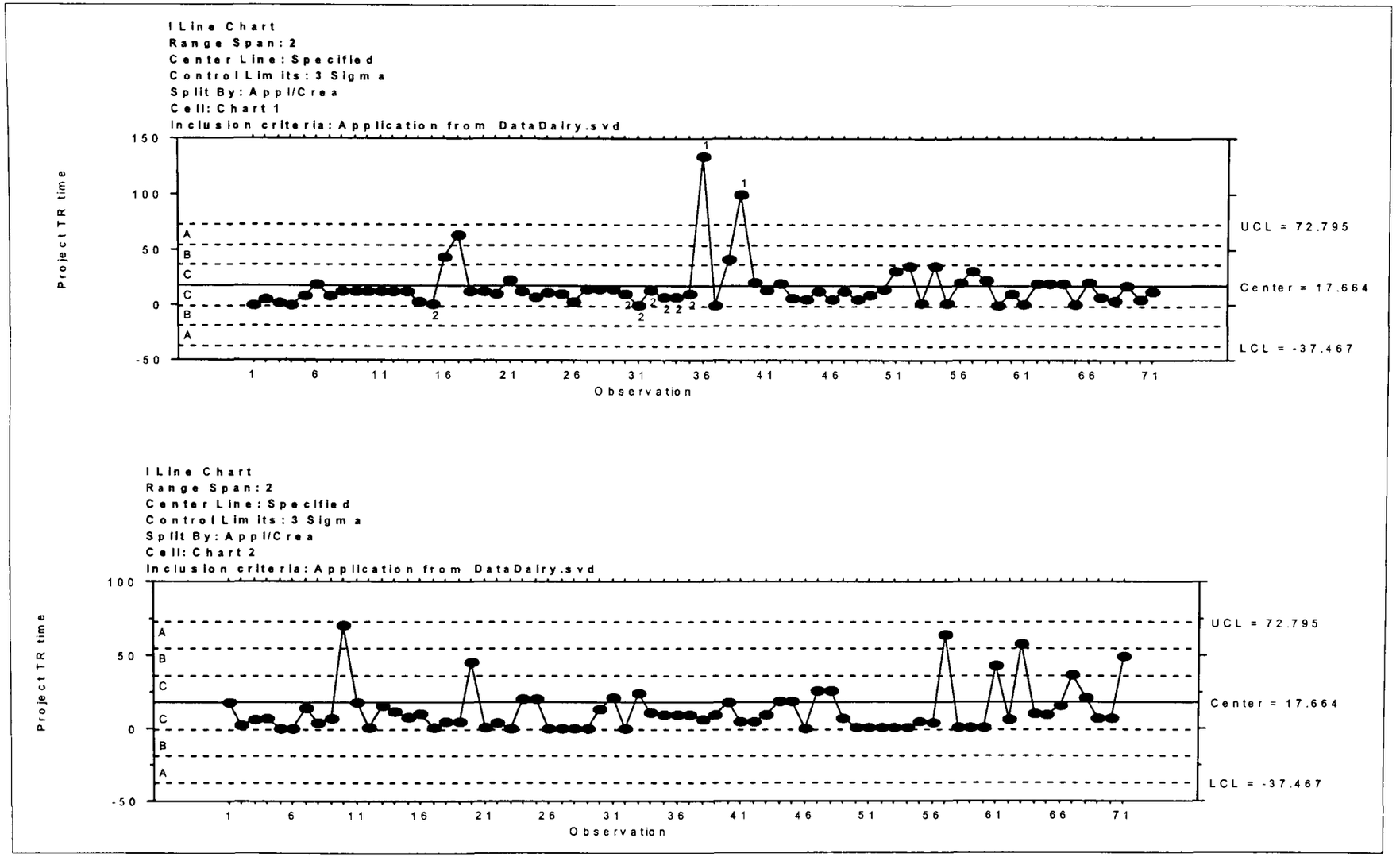


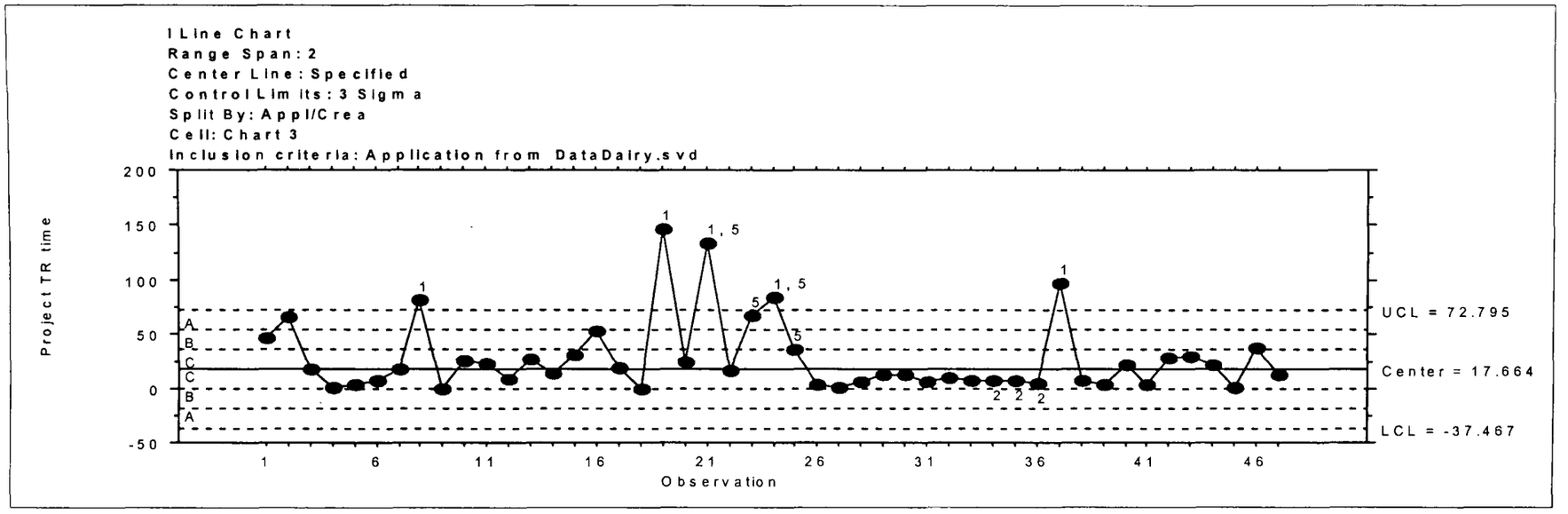
Dairy BU - All Projects
Control Limits Calculated using Resampled Data's Mean

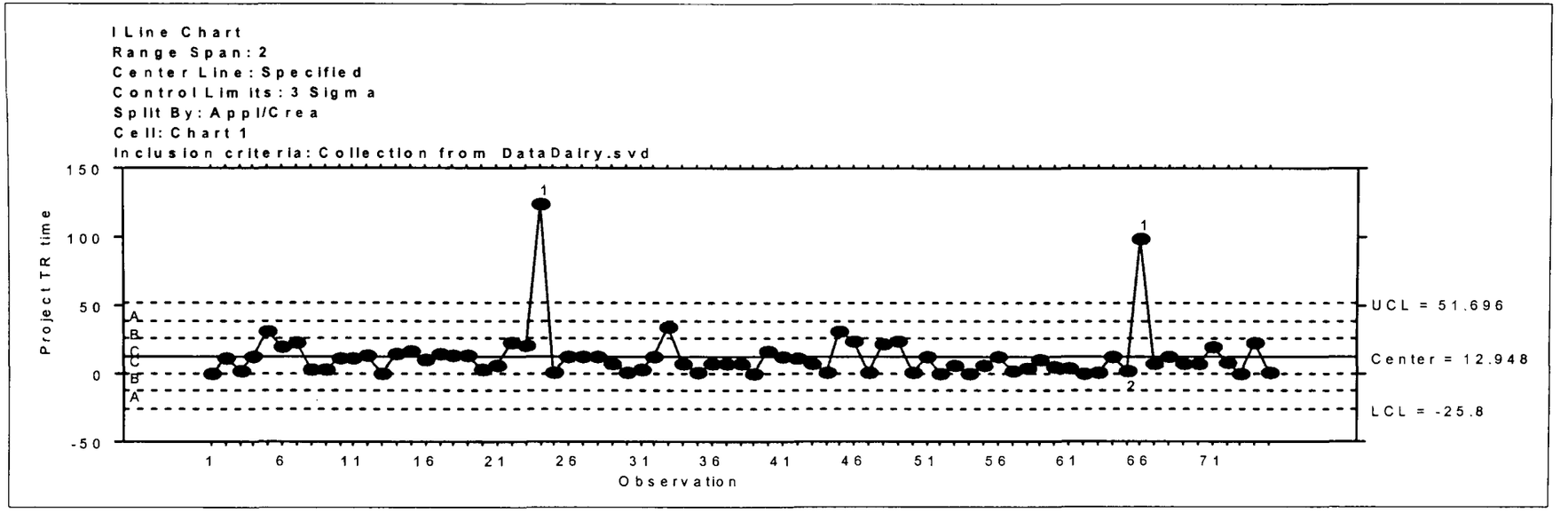


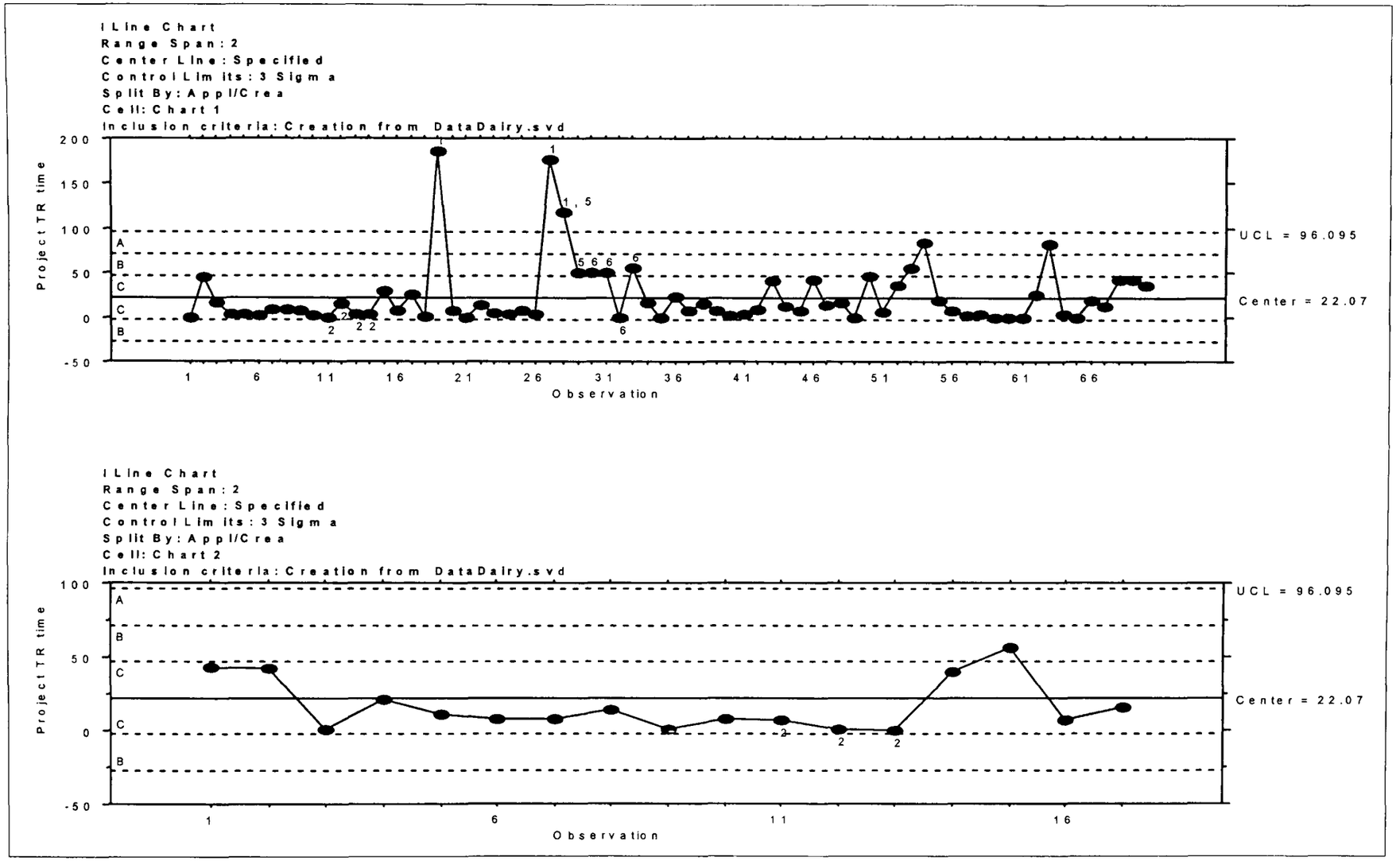
Dairy BU - All Projects
Control Limits Calculated using Resampled Data's Mean

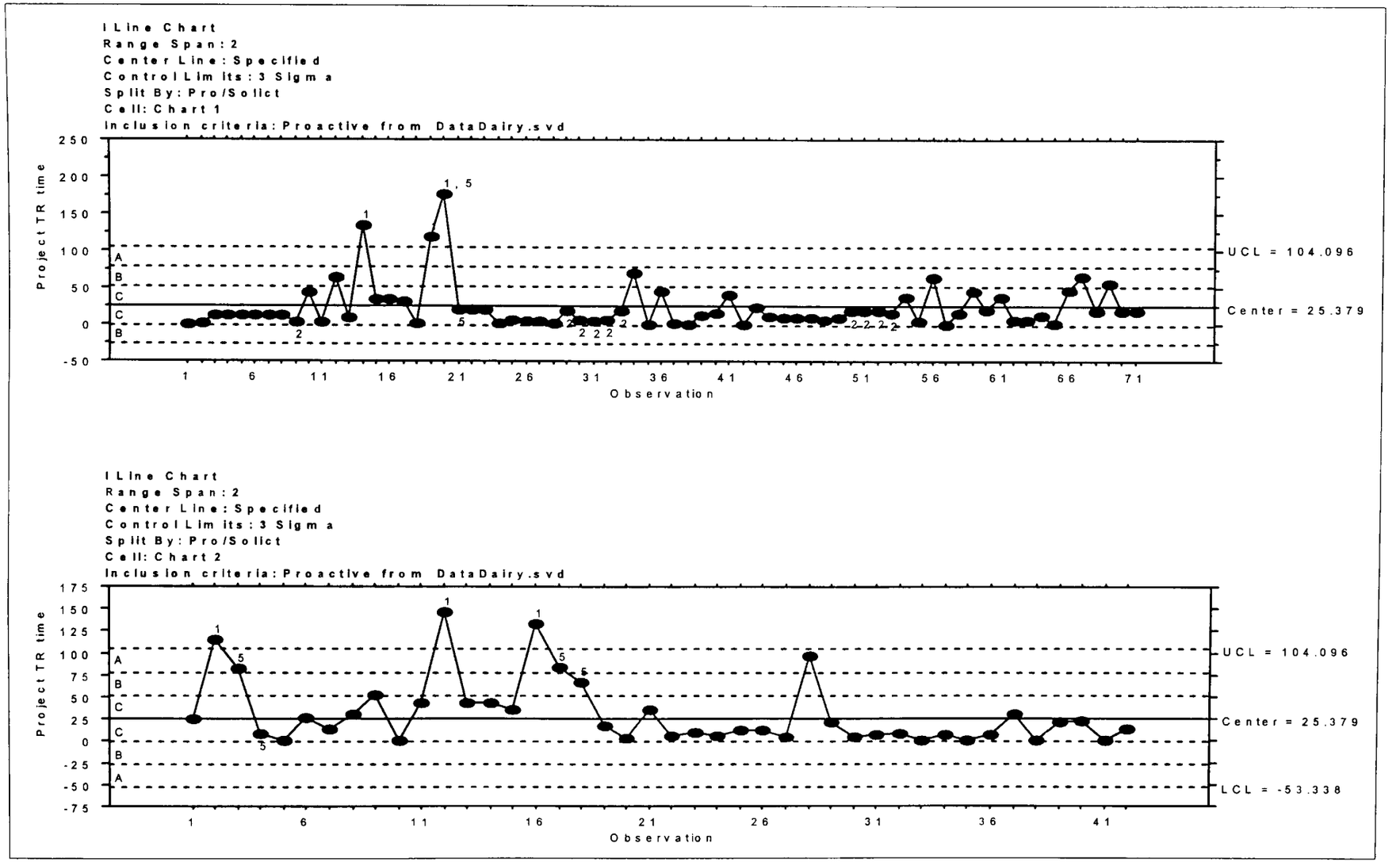


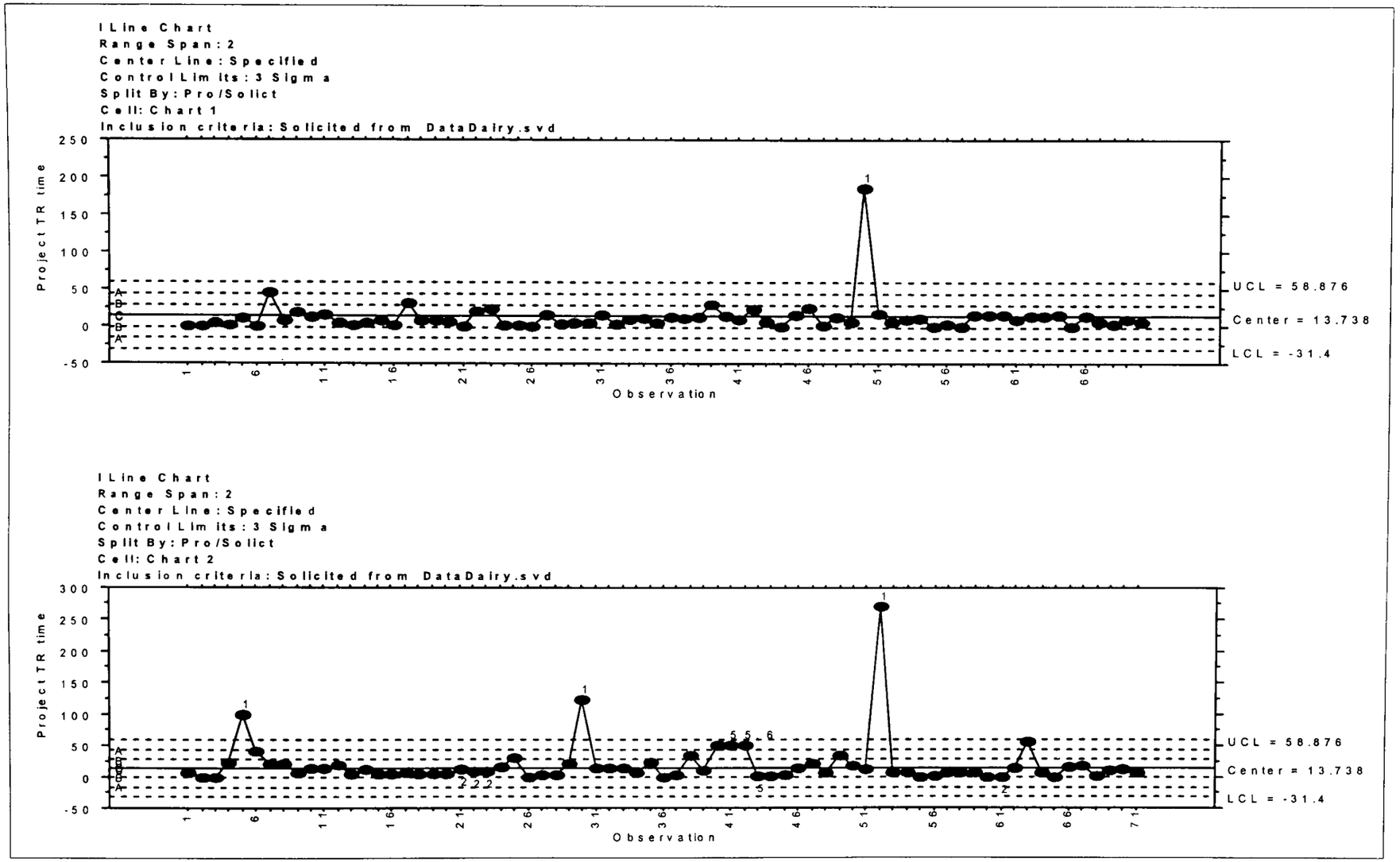

I Line Chart
Range Span: 2
Center Line: Specified
Control Limits: 3 Sigma
Split By: Appl/Crea
Cell: Chart 1
Inclusion criteria: Application from DataDairy.svd
Project TR time
Observation
UCL = 72.795
Center = 17.664
LCL = -37.467
I Line Chart
Range Span: 2
Center Line: Specified
Control Limits: 3 Sigma
Split By: Appl/Crea
Cell: Chart 2
Inclusion criteria: Application from DataDairy.svd
Project TR time
Observation
UCL = 72.795
Center = 17.664
LCL = -37.467

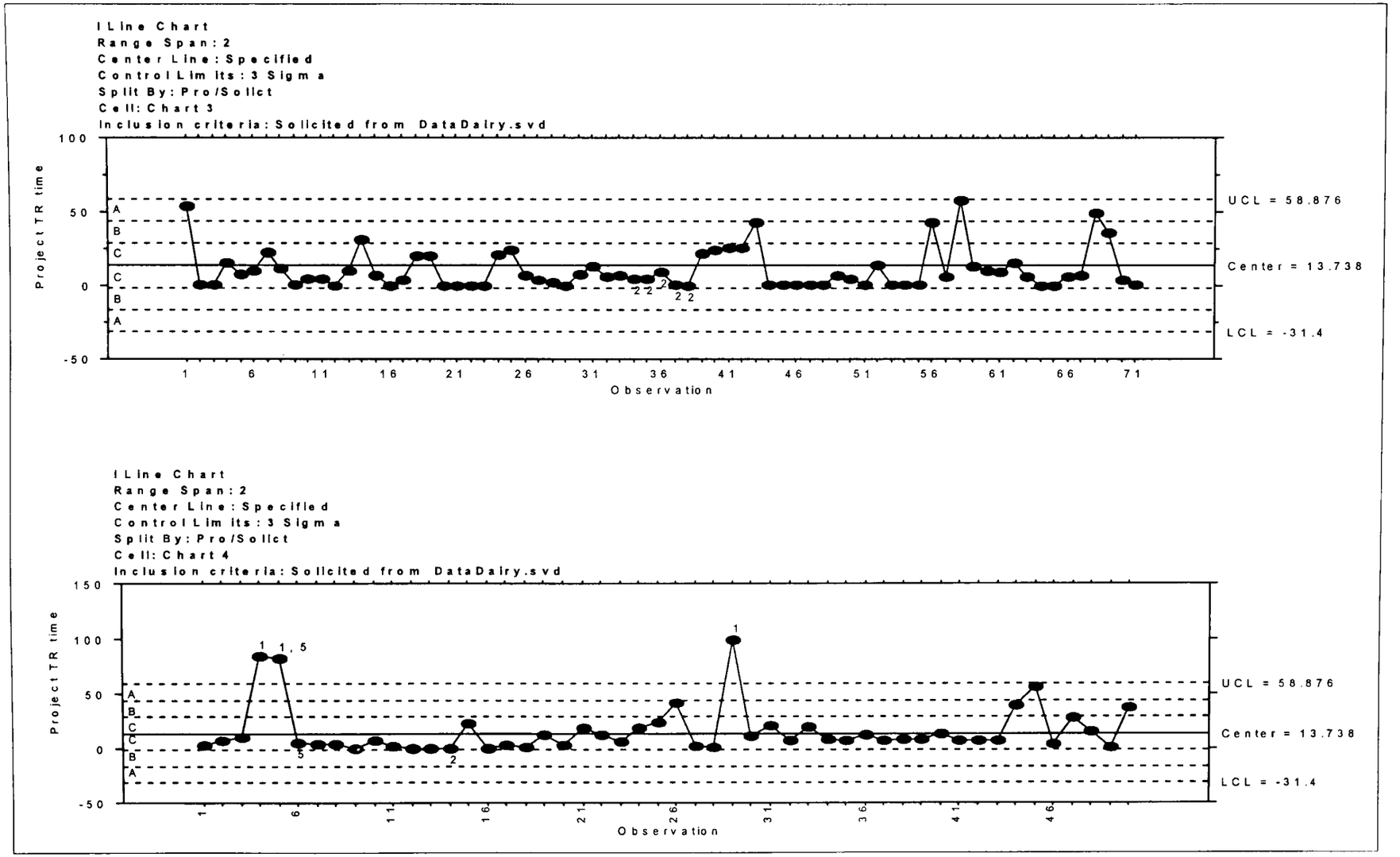

I Line Chart
Range Span: 2
Center Line: Specified
Control Limits: 3 Sigma
Split By: Appl/Crea
Cell: Chart 3
Inclusion criteria: Application from DataDairy.svd
Project TR time
200
150
100
50
0
-50
A
B
C
C
B
A
UCL = 72.795
Center = 17.664
LCL = -37.467
1
6
11
16
21
26
31
36
41
46
Observation


I Line Chart
Range Span: 2
Center Line: Specified
Control Limits: 3 Sigma
Split By: Appl/Crea
Cell: Chart 1
Inclusion criteria: Collection from DataDairy.svd
Project TR time
150
100
50
0
-50
A
B
C
C
B
A
1
1
2
UCL = 51.696
Center = 12.948
LCL = -25.8
1
6
11
16
21
26
31
36
41
46
51
56
61
66
71
Observation


I Line Chart
Range Span: 2
Center Line: Specified
Control Limits: 3 Sigma
Split By: Appl/Crea
Cell: Chart 1
Inclusion criteria: Creation from DataDairy.svd
Project TR time
200
150
100
50
0
-50
A
B
C
C
B
UCL = 96.095
Center = 22.07
1
6
11
16
21
26
31
36
41
46
51
56
61
66
Observation
I Line Chart
Range Span: 2
Center Line: Specified
Control Limits: 3 Sigma
Split By: Appl/Crea
Cell: Chart 2
Inclusion criteria: Creation from DataDairy.svd
Project TR time
100
50
0
-50
A
B
C
C
B
UCL = 96.095
Center = 22.07
1
6
11
16
Observation


I Line Chart
Range Span: 2
Center Line: Specified
Control Limits: 3 Sigma
Split By: Pro/Solict
Cell: Chart 1
Inclusion criteria: Proactive from DataDairy.svd
Project TR time
Observation
UCL = 104.096
Center = 25.379
I Line Chart
Range Span: 2
Center Line: Specified
Control Limits: 3 Sigma
Split By: Pro/Solict
Cell: Chart 2
Inclusion criteria: Proactive from DataDairy.svd
Project TR time
Observation
UCL = 104.096
Center = 25.379
LCL = -53.338


I Line Chart
Range Span: 2
Center Line: Specified
Control Limits: 3 Sigma
Split By: Pro/Solict
Cell: Chart 1
Inclusion criteria: Solicited from DataDairy.svd
Project TR time
Observation
UCL = 58.876
Center = 13.738
LCL = -31.4
I Line Chart
Range Span: 2
Center Line: Specified
Control Limits: 3 Sigma
Split By: Pro/Solict
Cell: Chart 2
Inclusion criteria: Solicited from DataDairy.svd
Project TR time
Observation
UCL = 58.876
Center = 13.738
LCL = -31.4

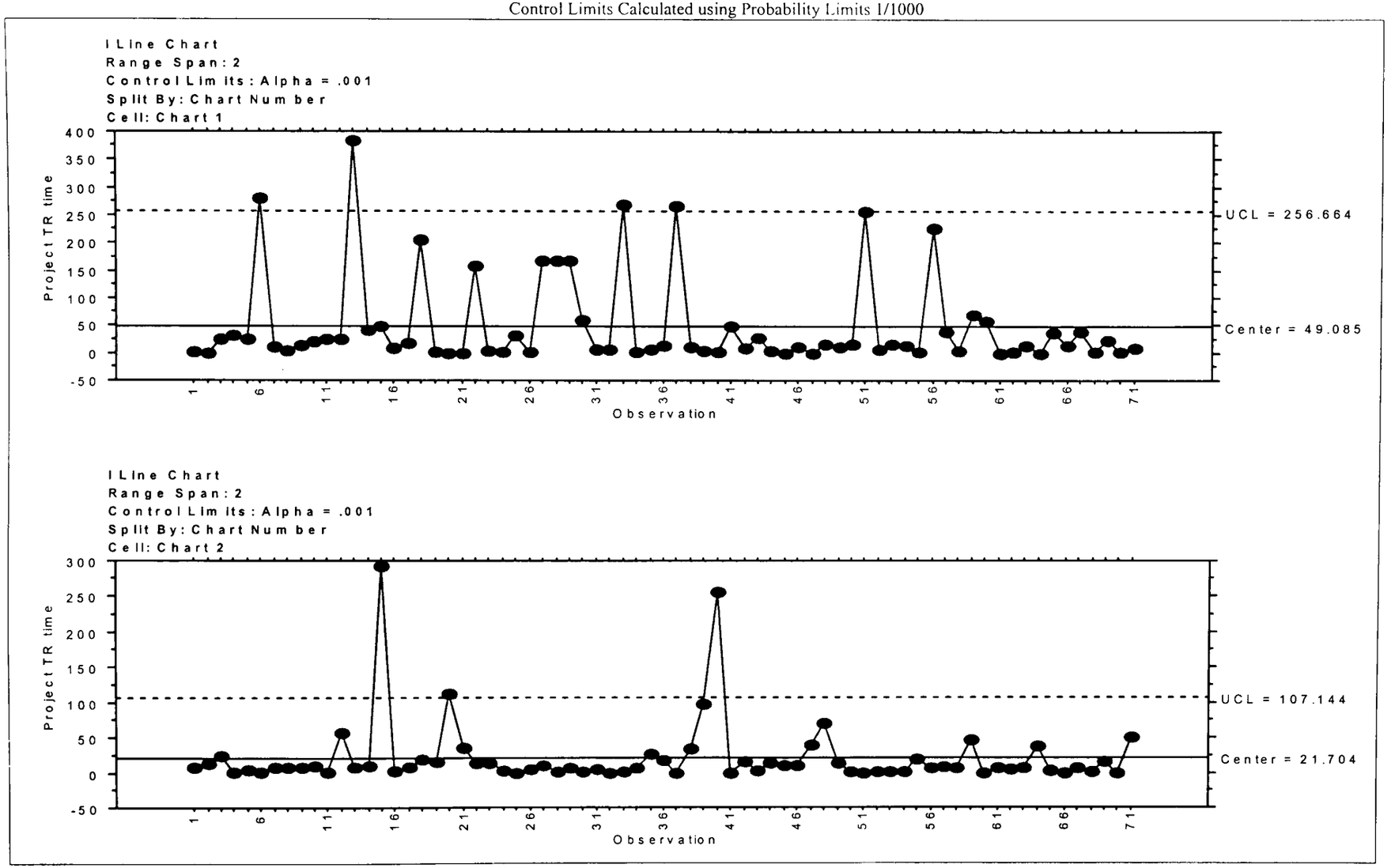

I Line Chart
Range Span: 2
Center Line: Specified
Control Limits: 3 Sigma
Split By: Pro/Solict
Cell: Chart 3
Inclusion criteria: Solicited from DataDairy.svd
Project TR time
100
50
0
-50
A
B
C
C
B
A
UCL = 58.876
Center = 13.738
LCL = -31.4
1 6 11 16 21 26 31 36 41 46 51 56 61 66 71
Observation
I Line Chart
Range Span: 2
Center Line: Specified
Control Limits: 3 Sigma
Split By: Pro/Solict
Cell: Chart 4
Inclusion criteria: Solicited from DataDairy.svd
Project TR time
150
100
50
0
-50
UCL = 58.876
Center = 13.738
LCL = -31.4
1 6 11 16 21 26 31 36 41 46
Observation

Appendix 13

Control Charts for the 1/1000 Probability Limits

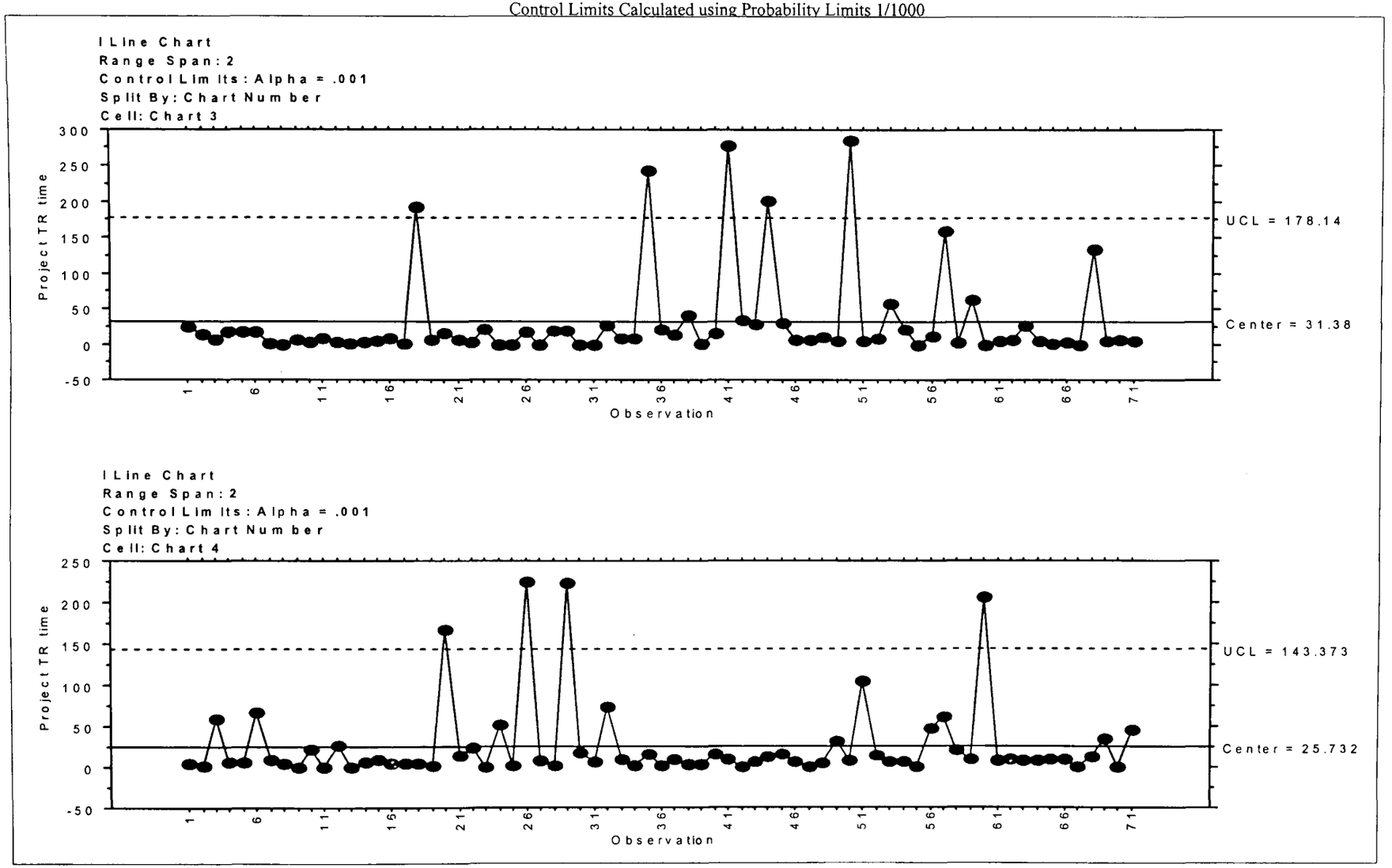
Beverage BU

Beverage BU - All Projects
Control Limits Calculated using Probability Limits 1/1000

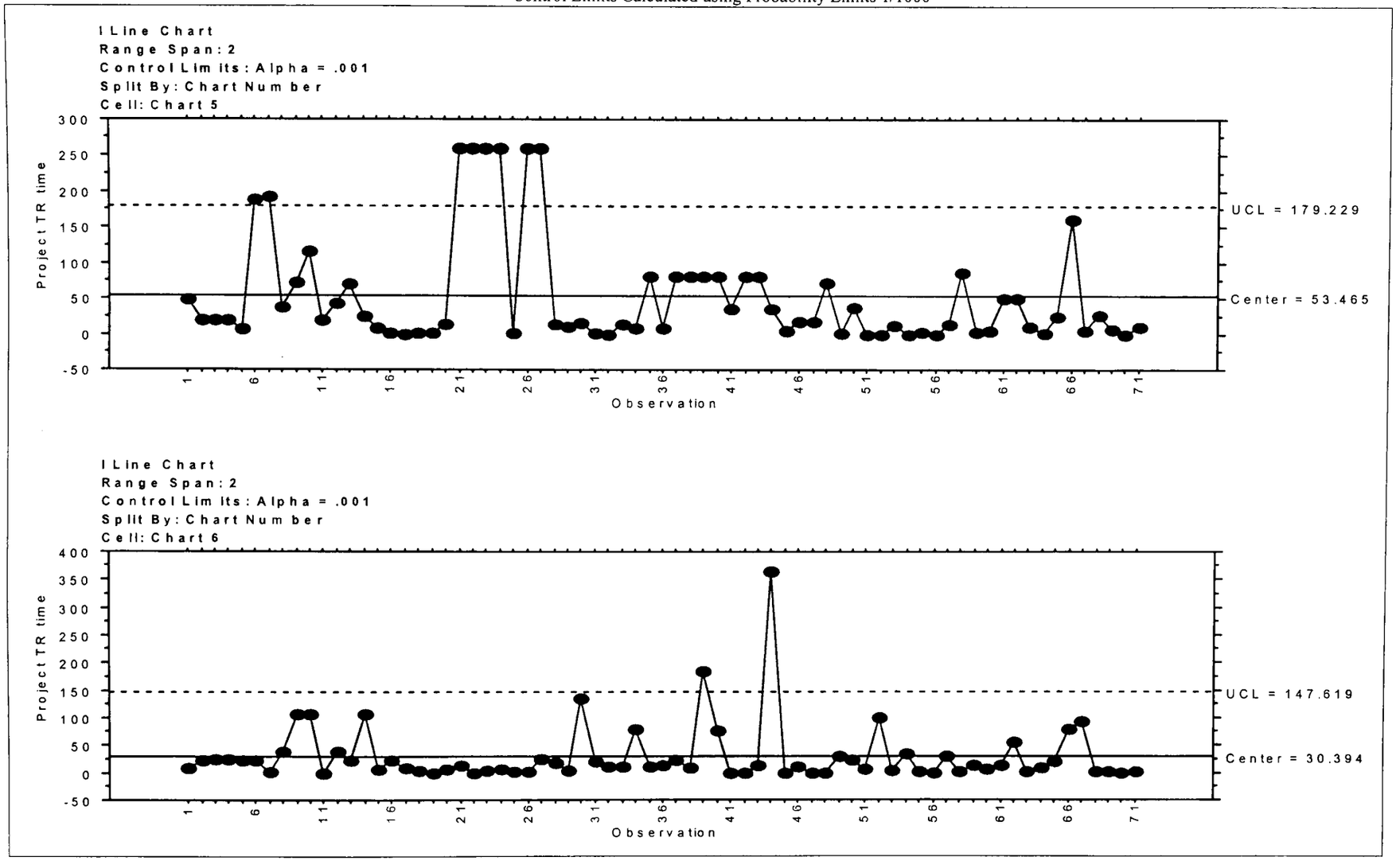


Beverage BU - All Projects

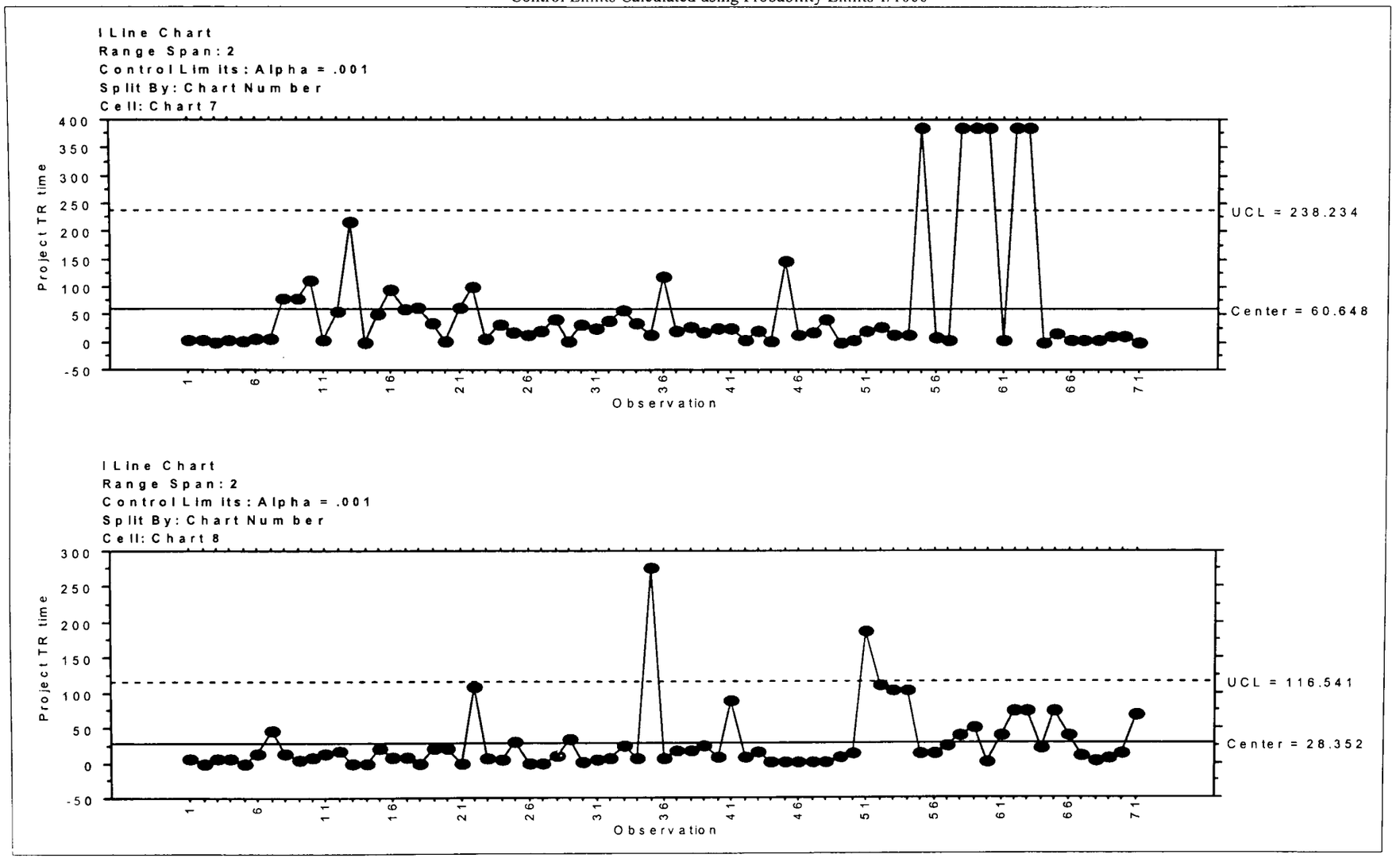
Control Limits Calculated using Probability Limits 1/1000



Beverage BU - All Projects
Control Limits Calculated using Probability Limits 1/1000

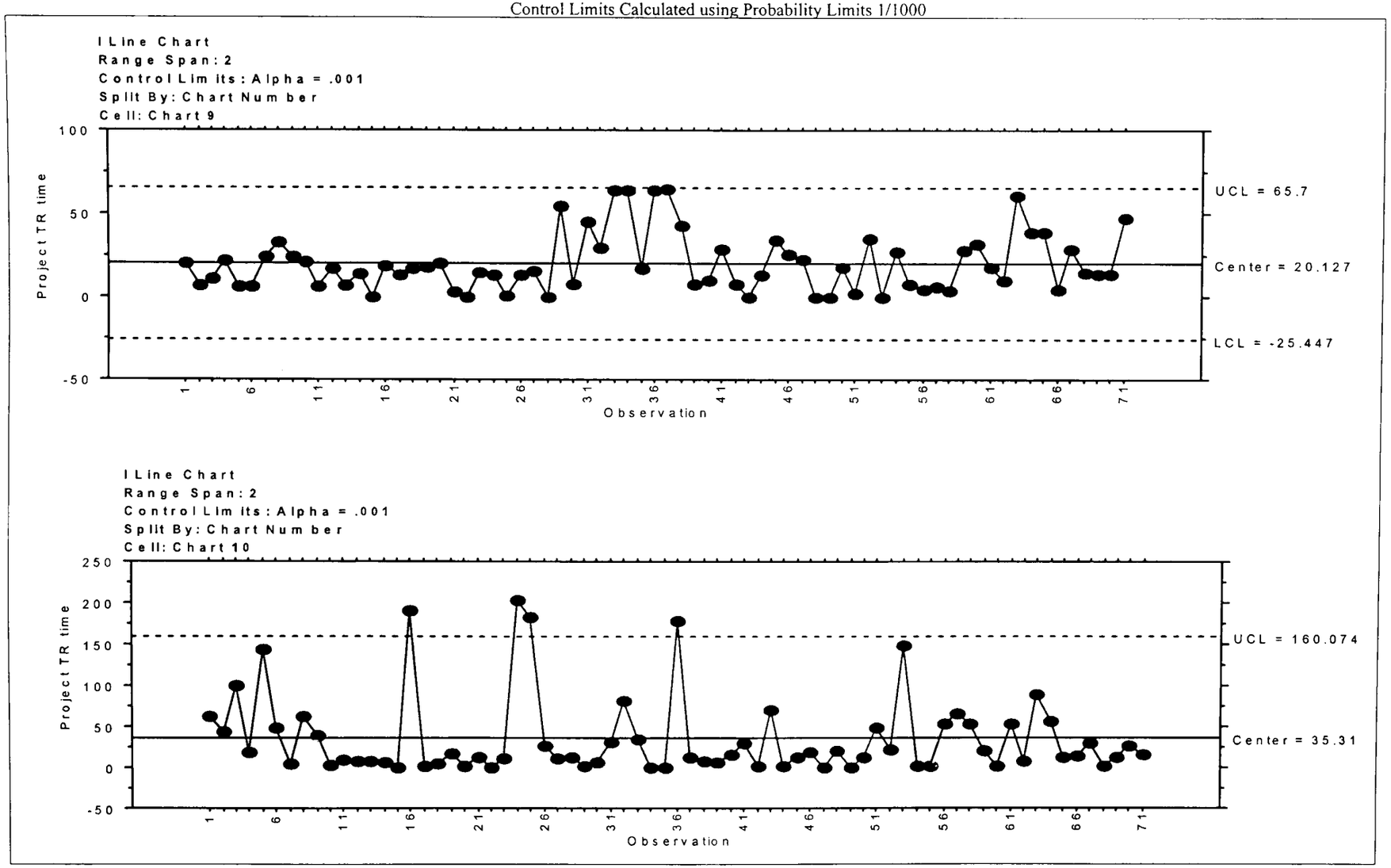


Beverage BU - All Projects
Control Limits Calculated using Probability Limits 1/1000

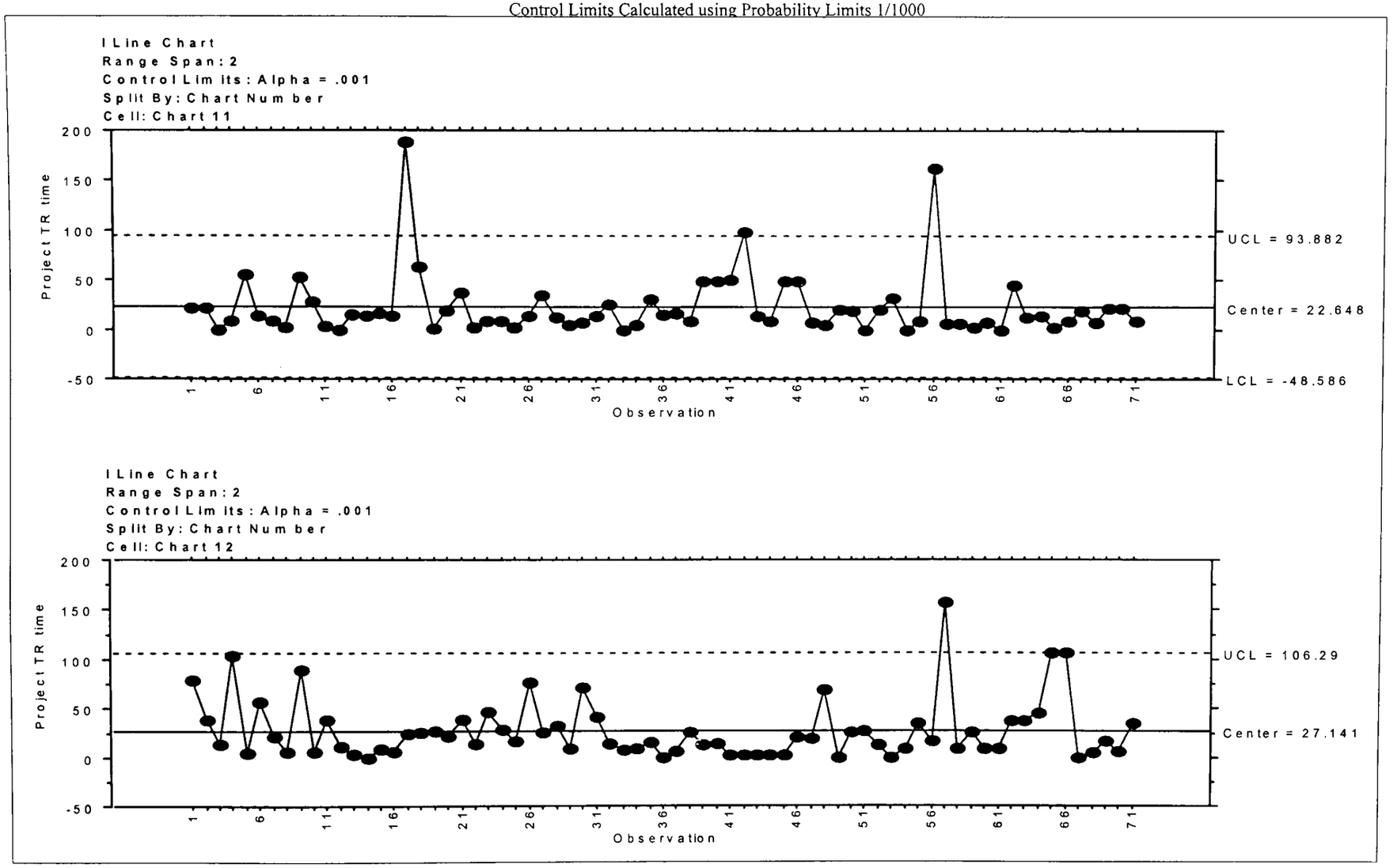


Beverage BU - All Projects

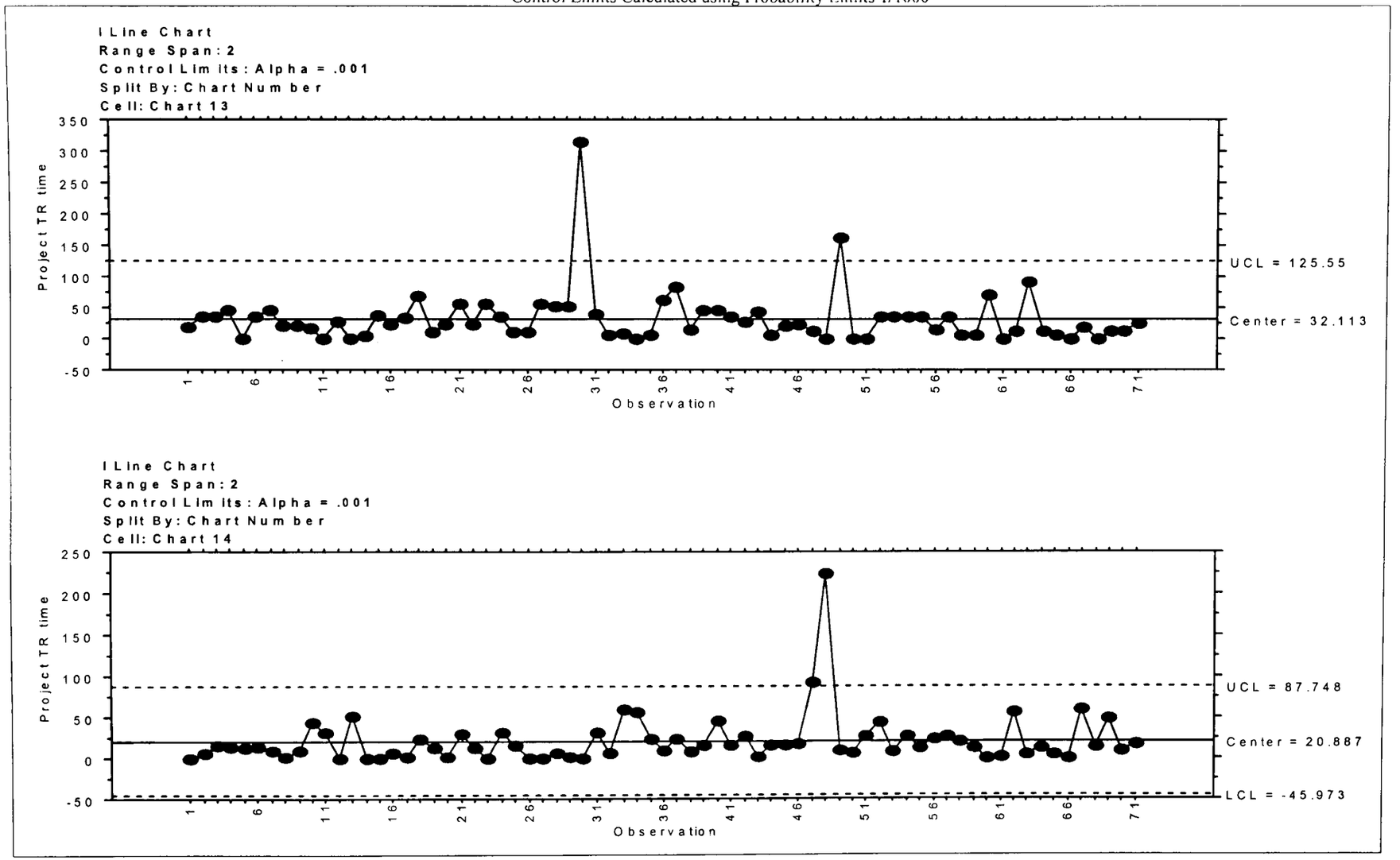
Control Limits Calculated using Probability Limits 1/1000



Beverage BU - All Projects
Control Limits Calculated using Probability Limits 1/1000

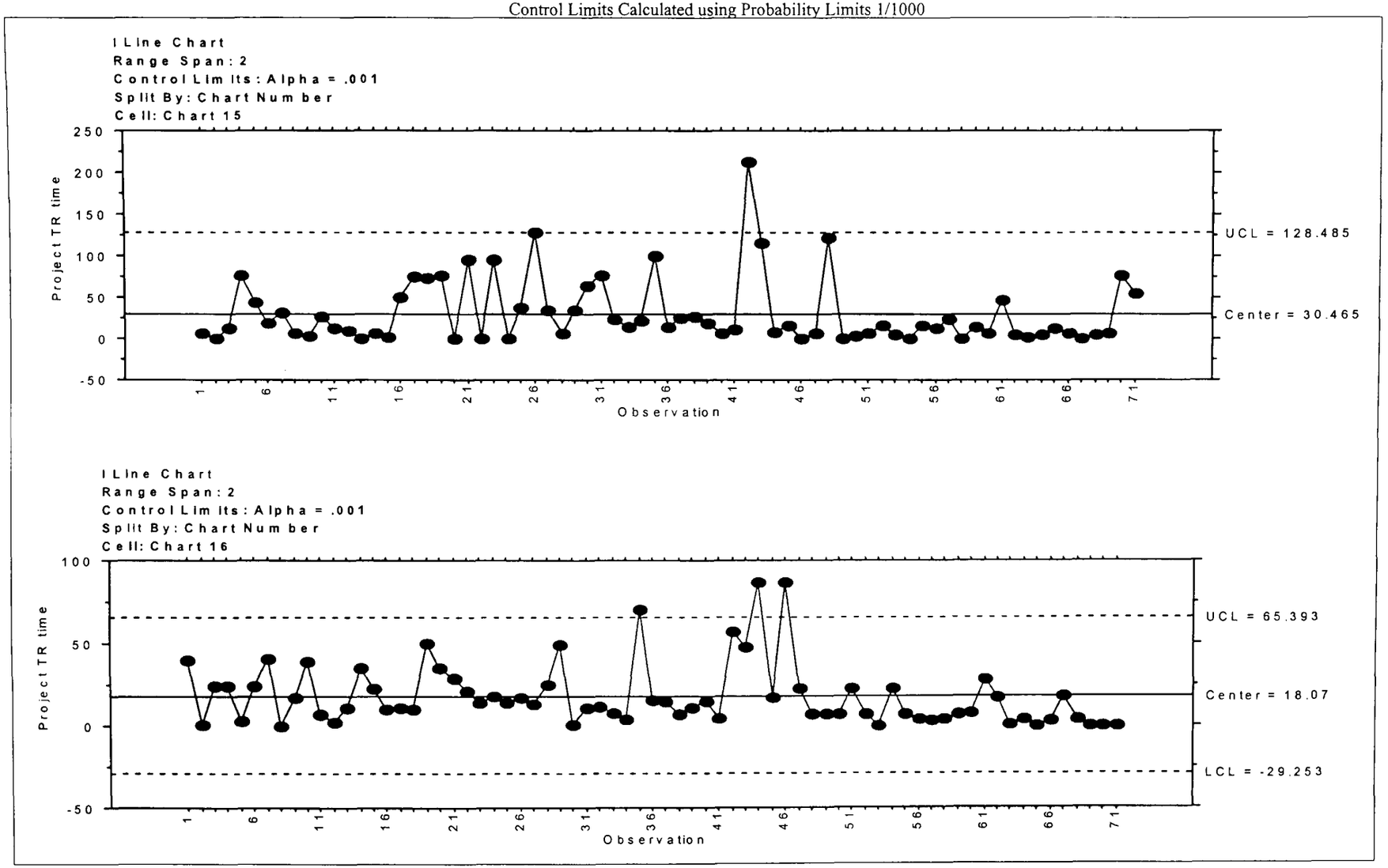


Beverage BU - All Projects
Control Limits Calculated using Probability Limits 1/1000

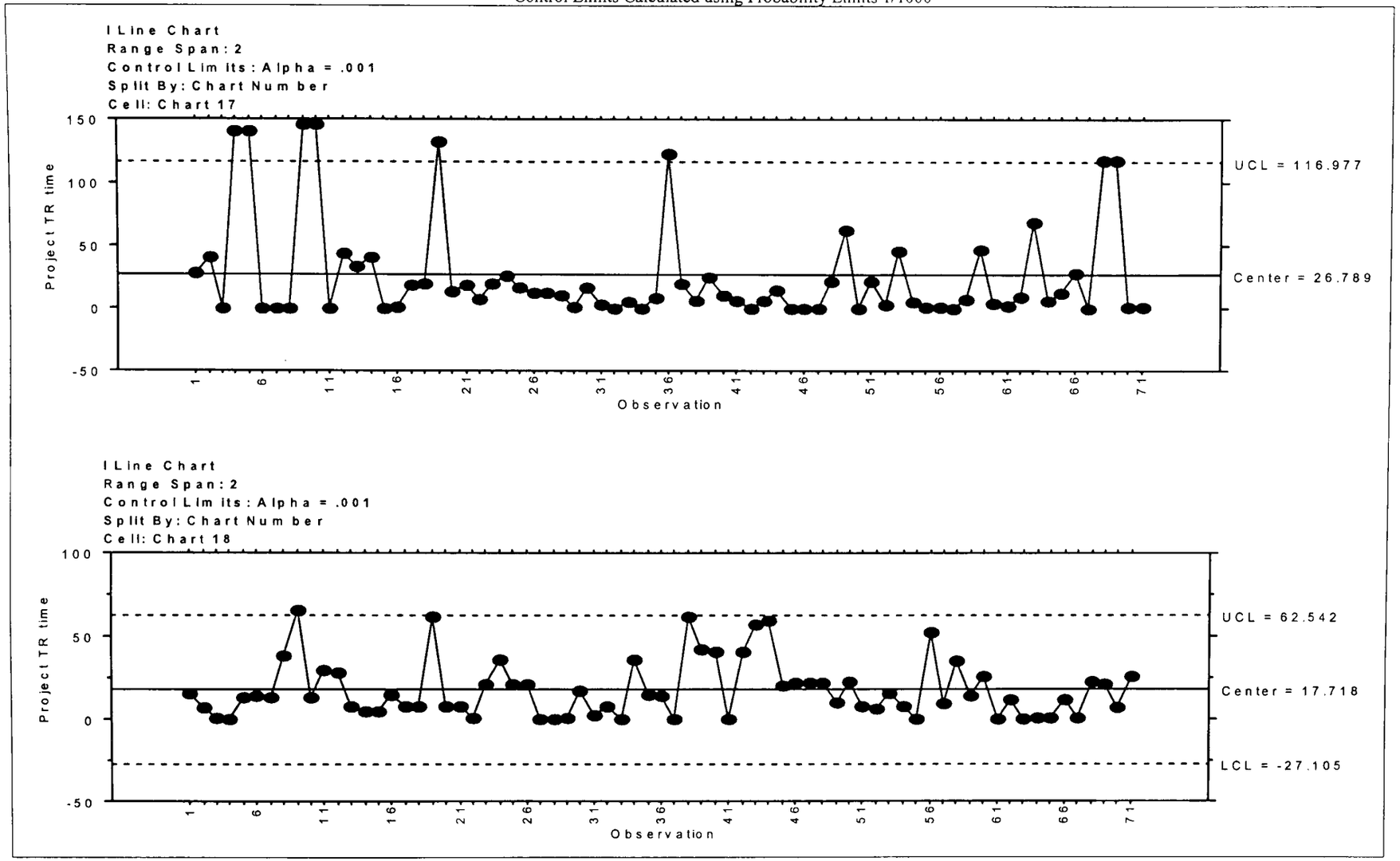


Beverage BU - All Projects

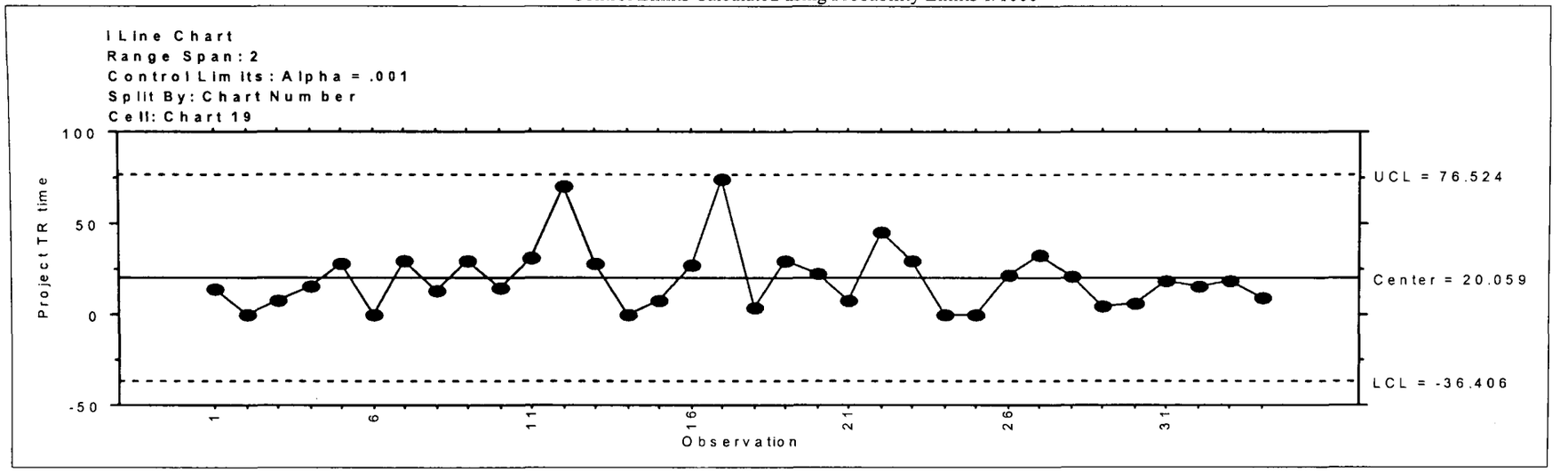
Control Limits Calculated using Probability Limits 1/1000

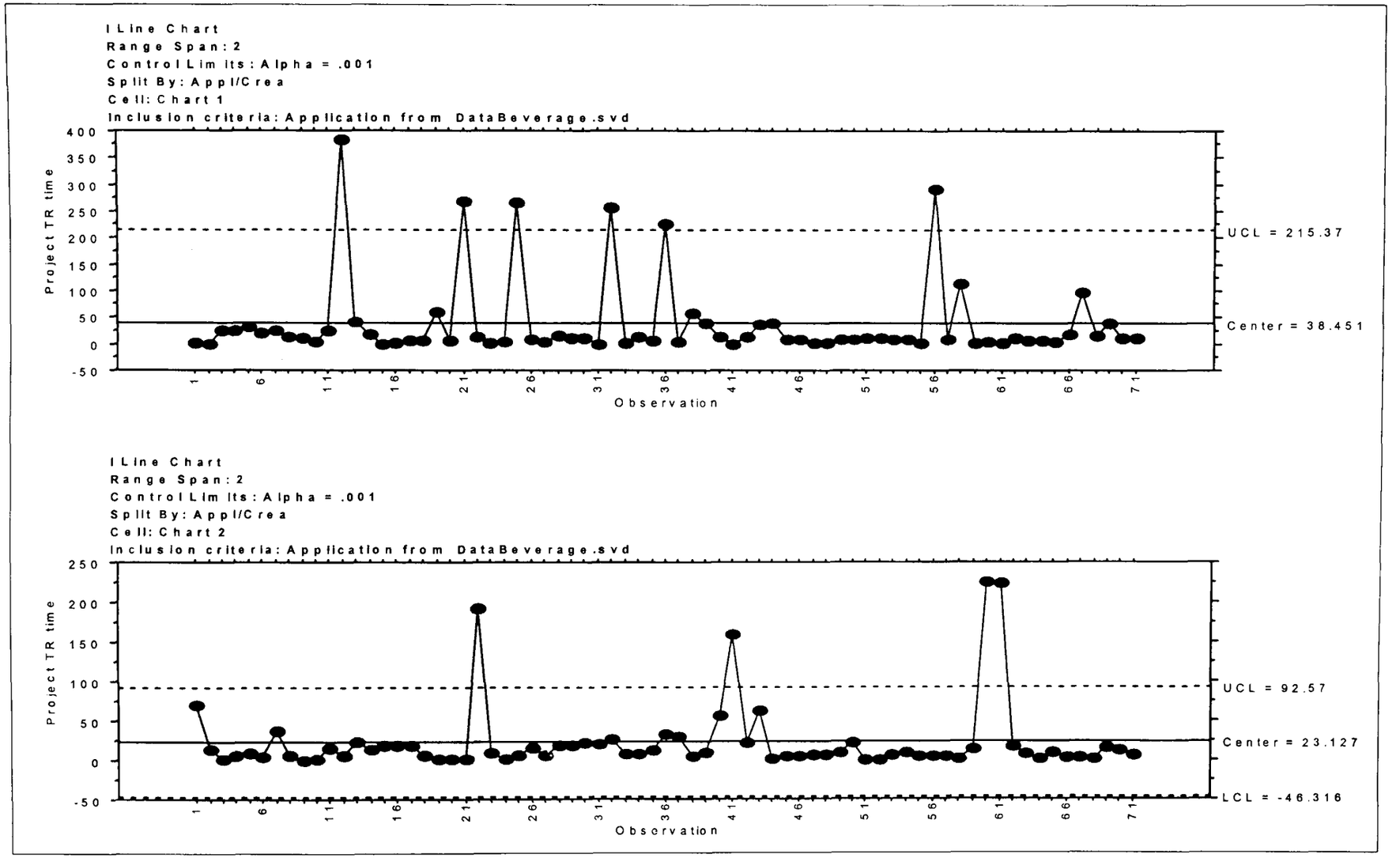


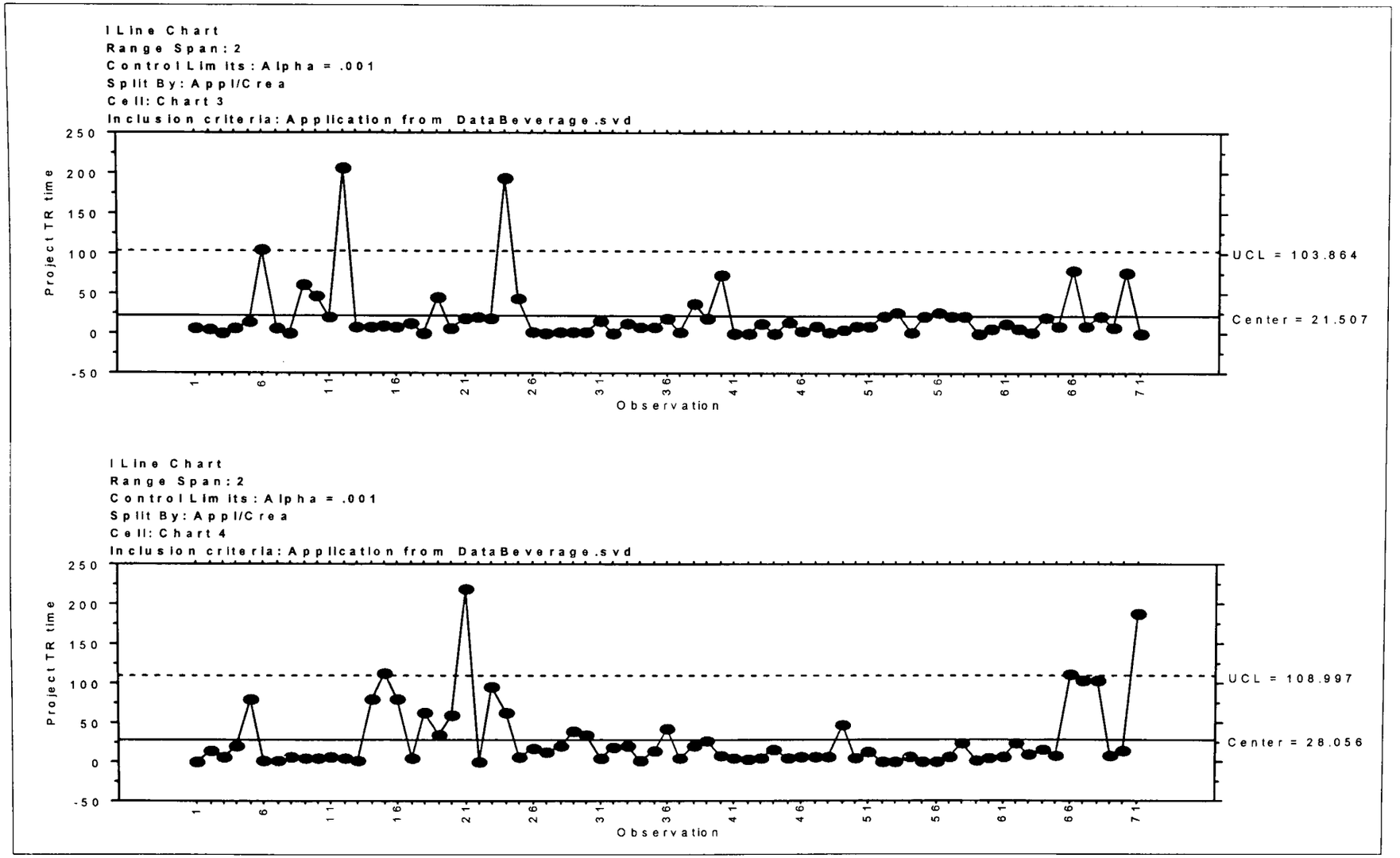
Beverage BU - All Projects
Control Limits Calculated using Probability Limits 1/1000

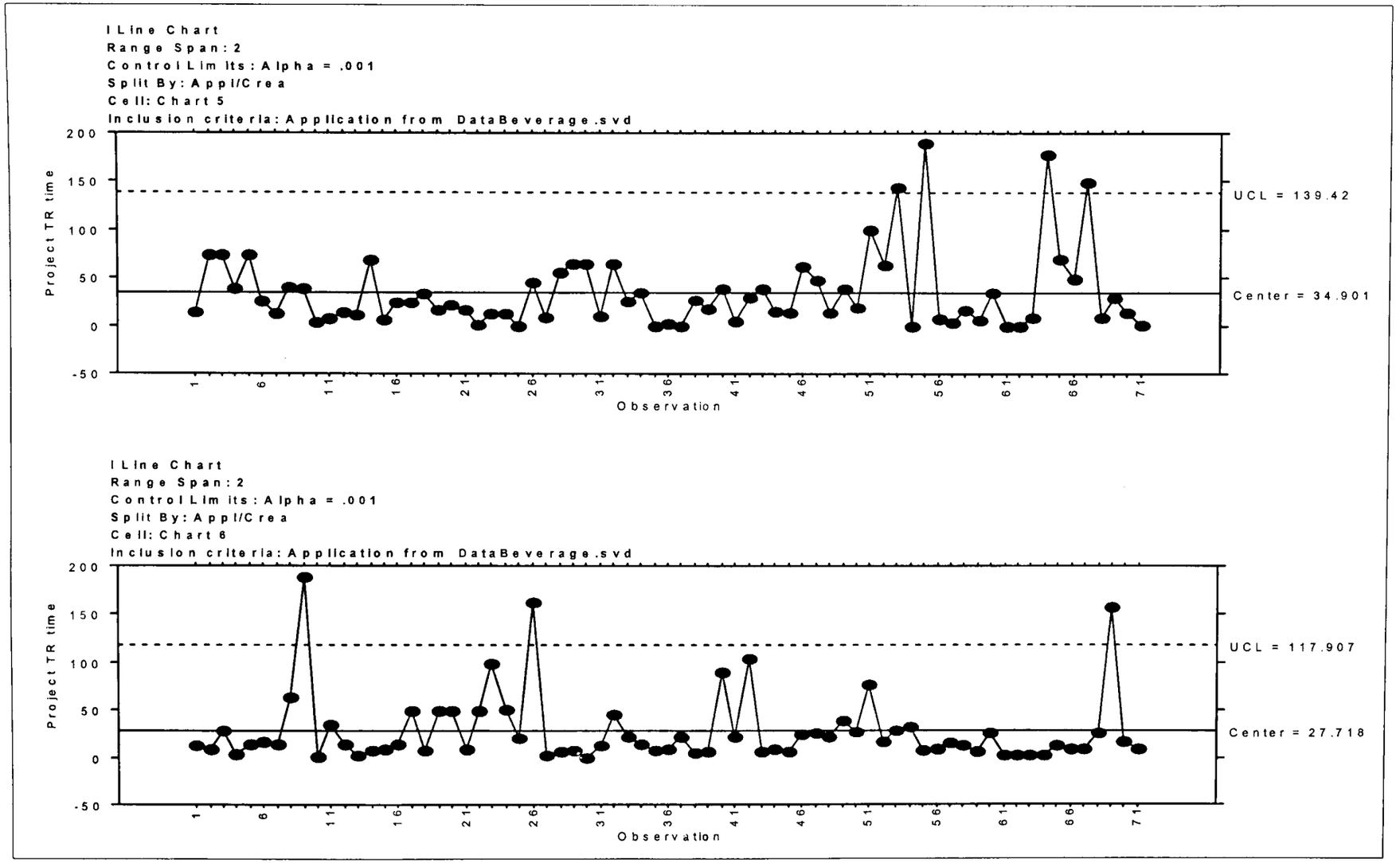


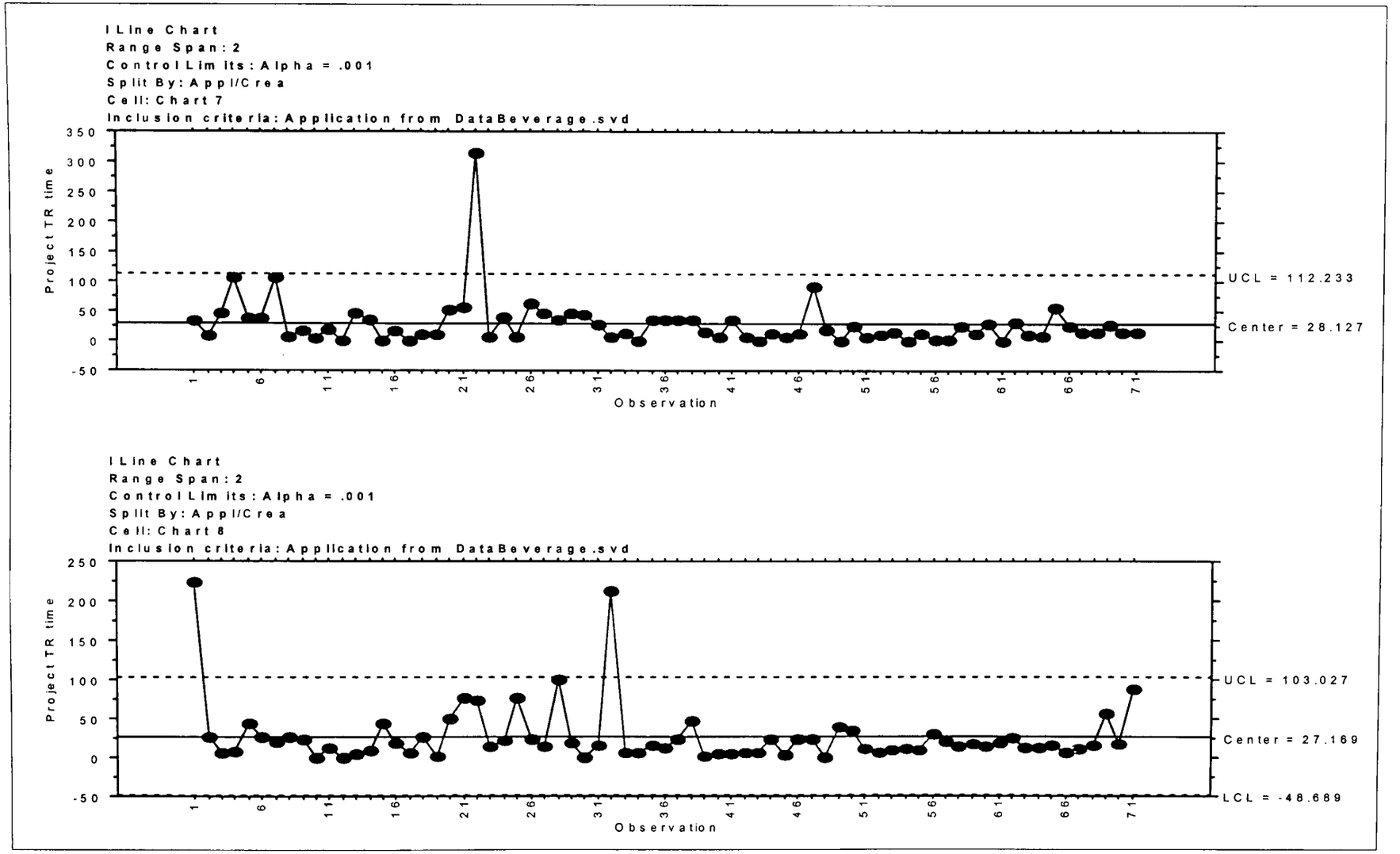
Beverage BU - All Projects
Control Limits Calculated using Probability Limits 1/1000

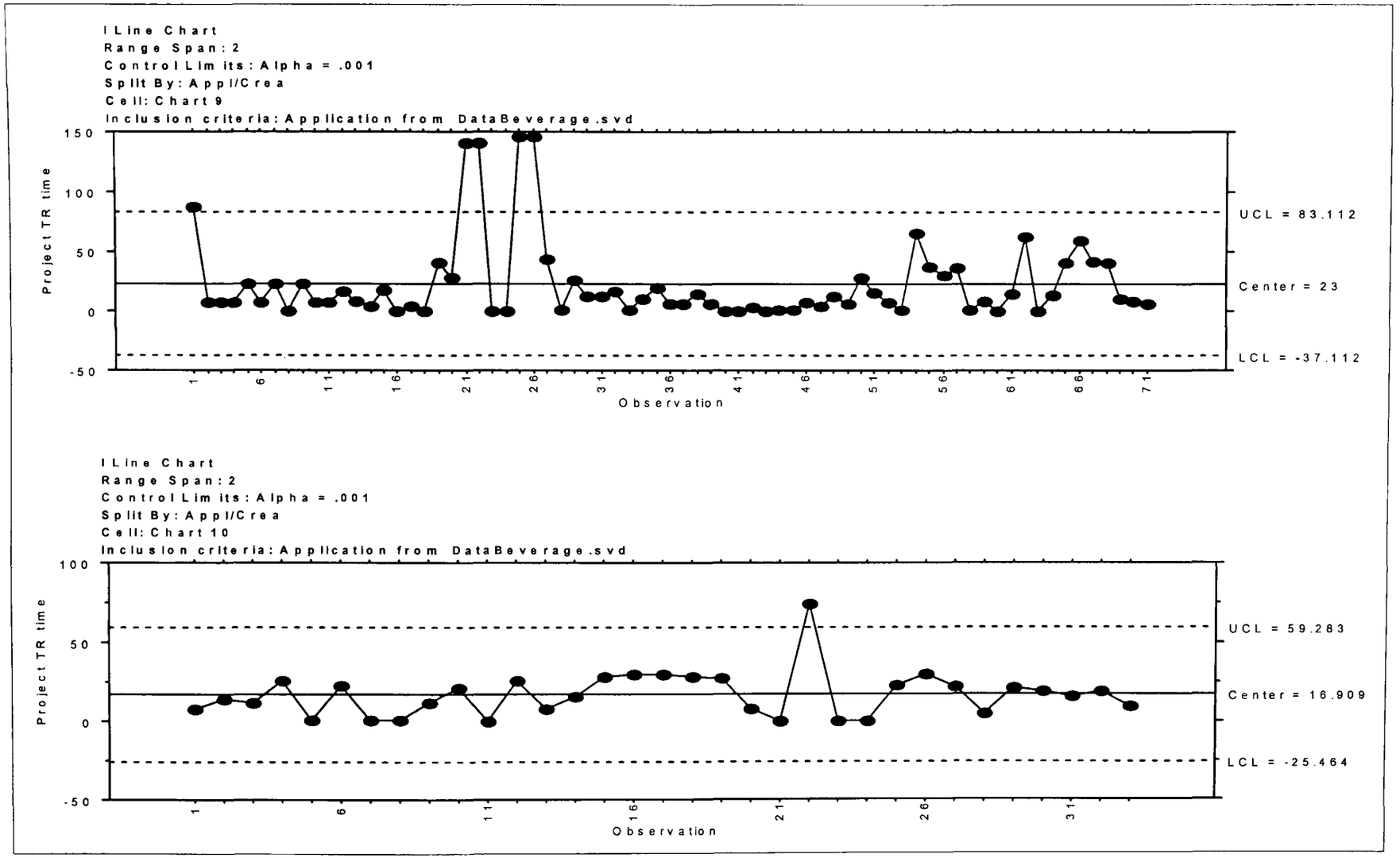


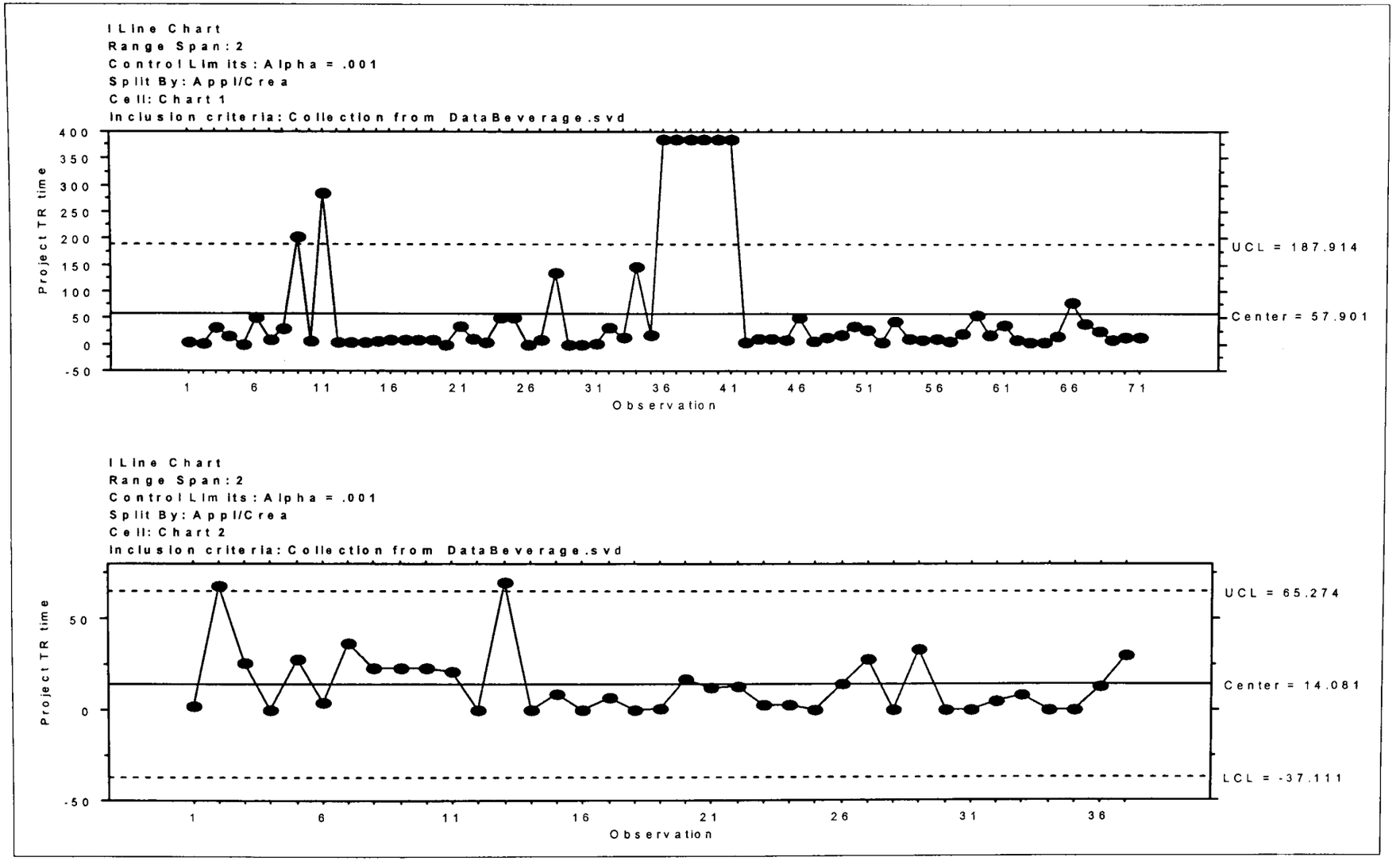

I Line Chart
Range Span: 2
Control Limits: Alpha = .001
Split By: Appl/Crea
Cell: Chart 1
Inclusion criteria: Application from DataBeverage.svd
Project TR time
400
350
300
250
200
150
100
50
0
-50
UCL = 215.37
Center = 38.451
1
6
11
16
21
26
31
36
41
46
51
56
61
66
71
Observation
I Line Chart
Range Span: 2
Control Limits: Alpha = .001
Split By: Appl/Crea
Cell: Chart 2
Inclusion criteria: Application from DataBeverage.svd
Project TR time
250
200
150
100
50
0
-50
UCL = 92.57
Center = 23.127
LCL = -46.316
1
6
11
16
21
26
31
36
41
46
51
56
61
66
71
Observation

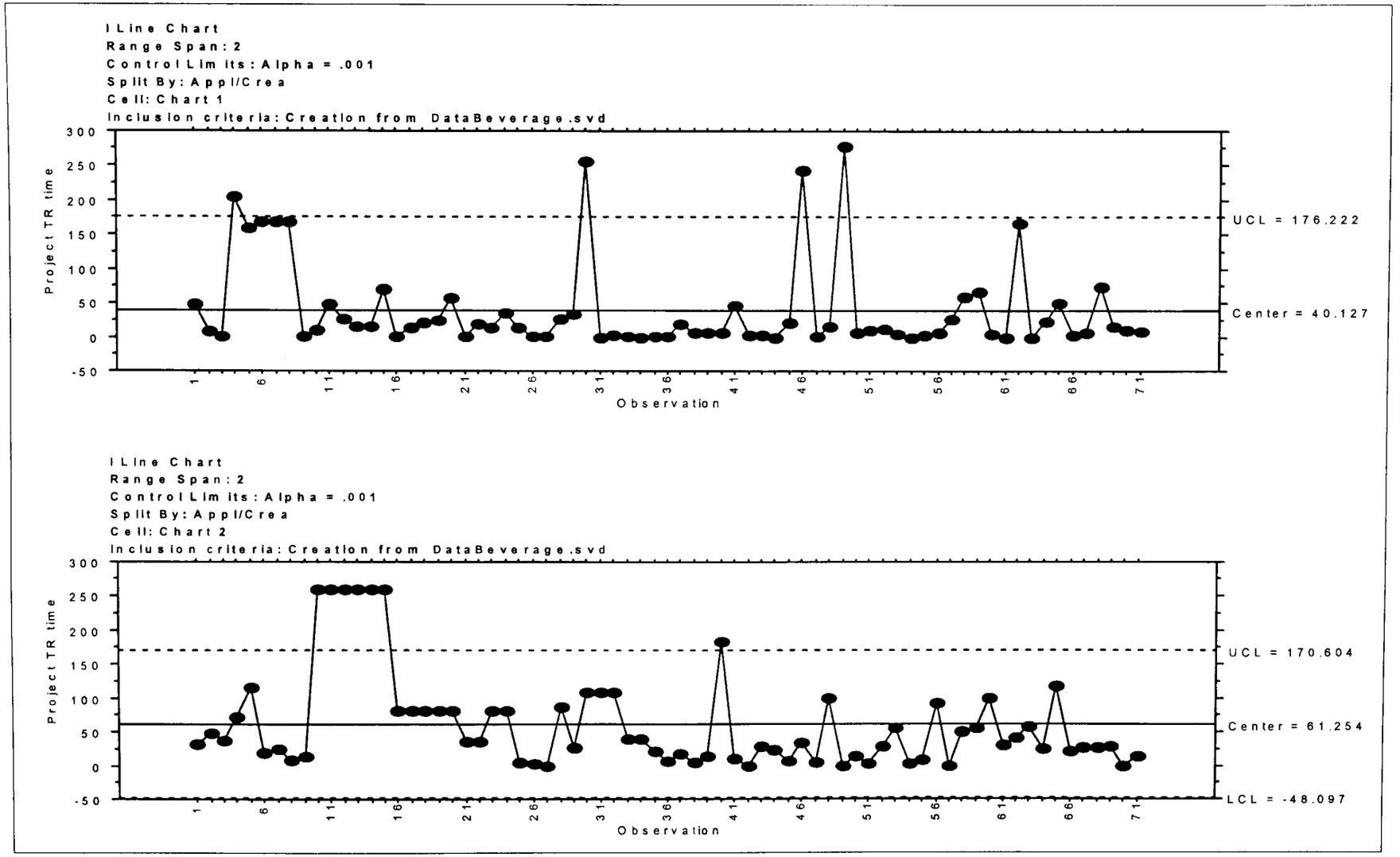

I Line Chart
Range Span: 2
Control Limits: Alpha = .001
Split By: Appl/Crea
Cell: Chart 3
Inclusion criteria: Application from DataBeverage.svd
Project TR time
250
200
150
100
50
0
-50
1
6
11
16
21
26
31
36
41
46
51
56
61
66
71
Observation
UCL = 103.864
Center = 21.507
I Line Chart
Range Span: 2
Control Limits: Alpha = .001
Split By: Appl/Crea
Cell: Chart 4
Inclusion criteria: Application from DataBeverage.svd
Project TR time
250
200
150
100
50
0
-50
1
6
11
16
21
26
31
36
41
46
51
56
61
66
71
Observation
UCL = 108.997
Center = 28.056

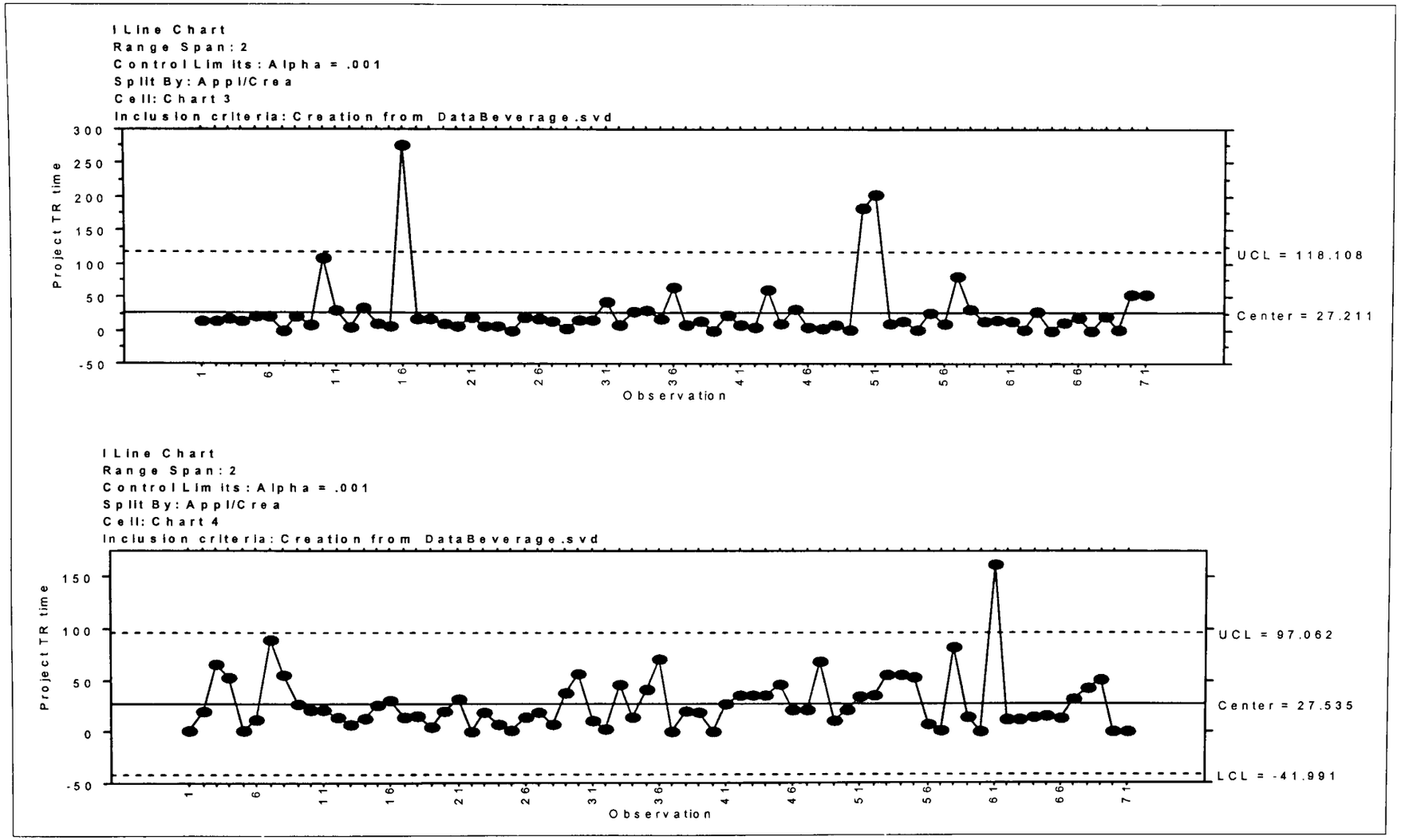

I Line Chart
Range Span: 2
Control Limits: Alpha = .001
Split By: Appl/Crea
Cell: Chart 5
Inclusion criteria: Application from DataBeverage.svd
Project TR time
200
150
100
50
0
-50
UCL = 139.42
Center = 34.901
1
6
11
16
21
26
31
36
41
46
51
56
61
66
71
Observation
I Line Chart
Range Span: 2
Control Limits: Alpha = .001
Split By: Appl/Crea
Cell: Chart 6
Inclusion criteria: Application from DataBeverage.svd
Project TR time
200
150
100
50
0
-50
UCL = 117.907
Center = 27.718
1
6
11
16
21
26
31
36
41
46
51
56
61
66
71
Observation

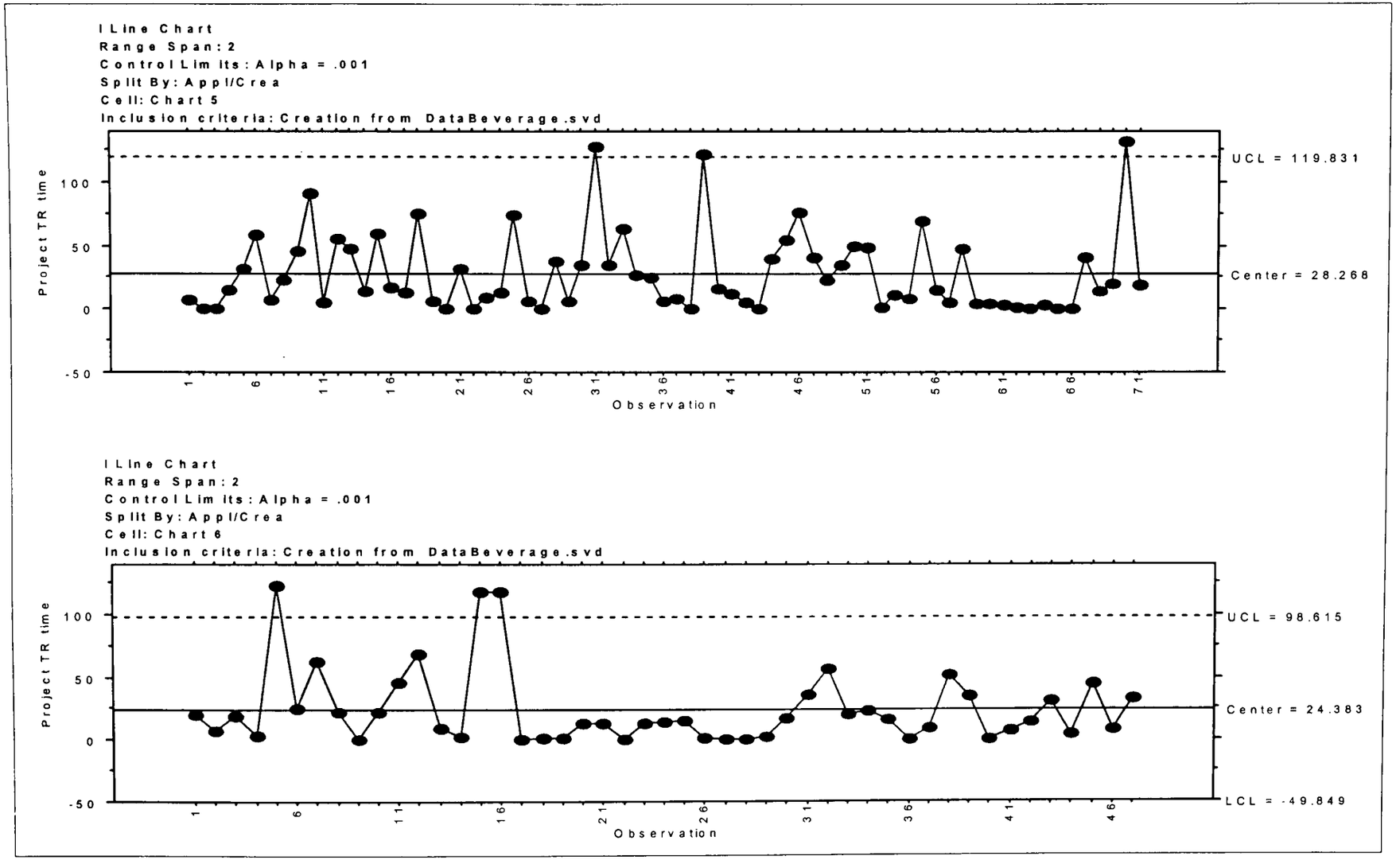

I Line Chart
Range Span: 2
Control Limits: Alpha = .001
Split By: Appl/Crea
Cell: Chart 7
Inclusion criteria: Application from DataBeverage.svd
Project TR time
350
300
250
200
150
100
50
0
-50
1
6
11
16
21
26
31
36
41
46
51
56
61
66
71
Observation
UCL = 112.233
Center = 28.127
I Line Chart
Range Span: 2
Control Limits: Alpha = .001
Split By: Appl/Crea
Cell: Chart 8
Inclusion criteria: Application from DataBeverage.svd
Project TR time
250
200
150
100
50
0
-50
1
6
11
16
21
26
31
36
41
46
51
56
61
66
71
Observation
UCL = 103.027
Center = 27.169
LCL = -48.689

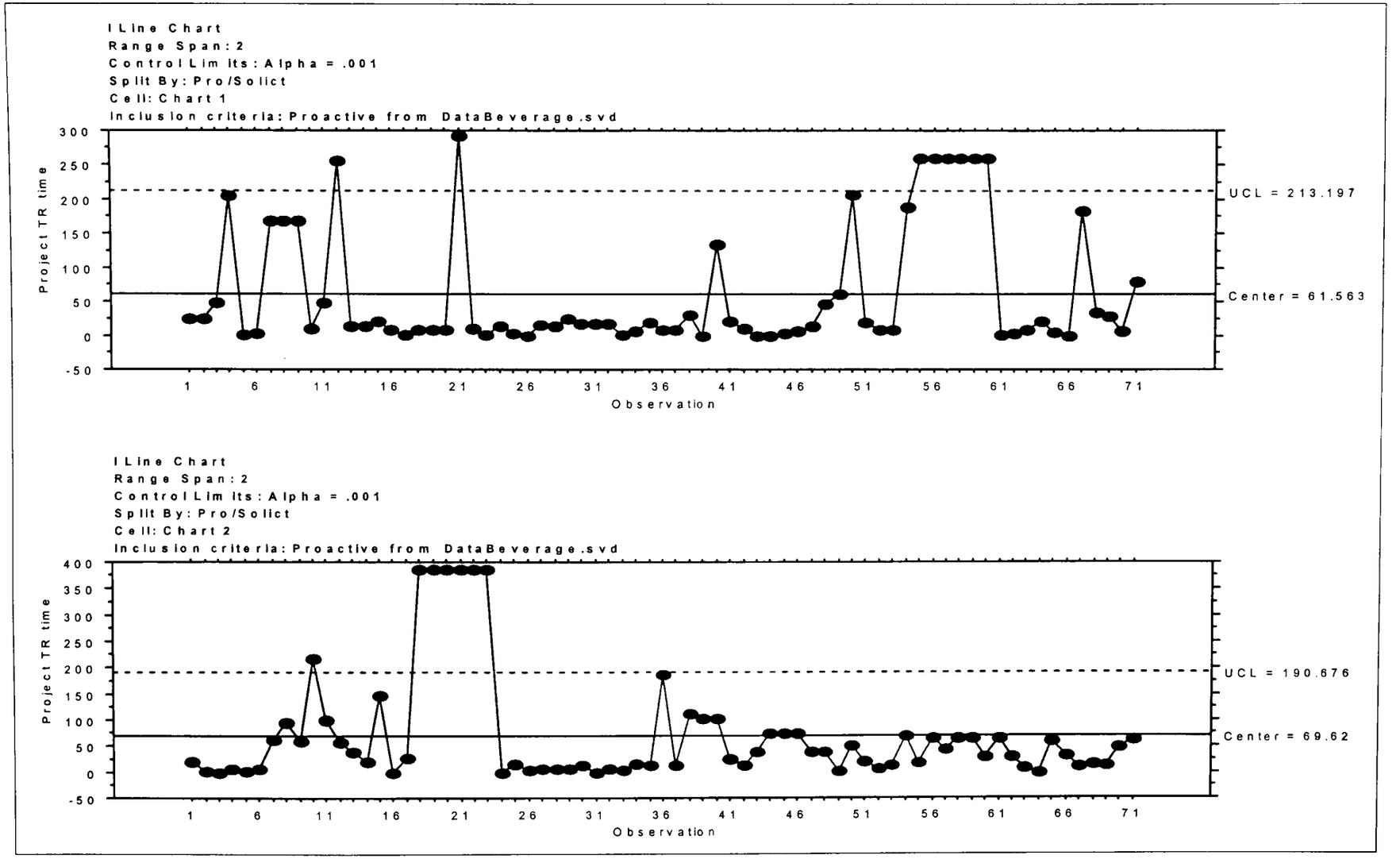

I Line Chart
Range Span: 2
Control Limits: Alpha = .001
Split By: Appl/Crea
Cell: Chart 9
Inclusion criteria: Application from DataBeverage.svd
Project TR time
150
100
50
0
-50
UCL = 83.112
Center = 23
LCL = -37.112
1
6
11
16
21
26
31
36
41
46
51
56
61
66
71
Observation
I Line Chart
Range Span: 2
Control Limits: Alpha = .001
Split By: Appl/Crea
Cell: Chart 10
Inclusion criteria: Application from DataBeverage.svd
Project TR time
100
50
0
-50
UCL = 59.283
Center = 16.909
LCL = -25.464
1
6
11
16
21
26
31
Observation

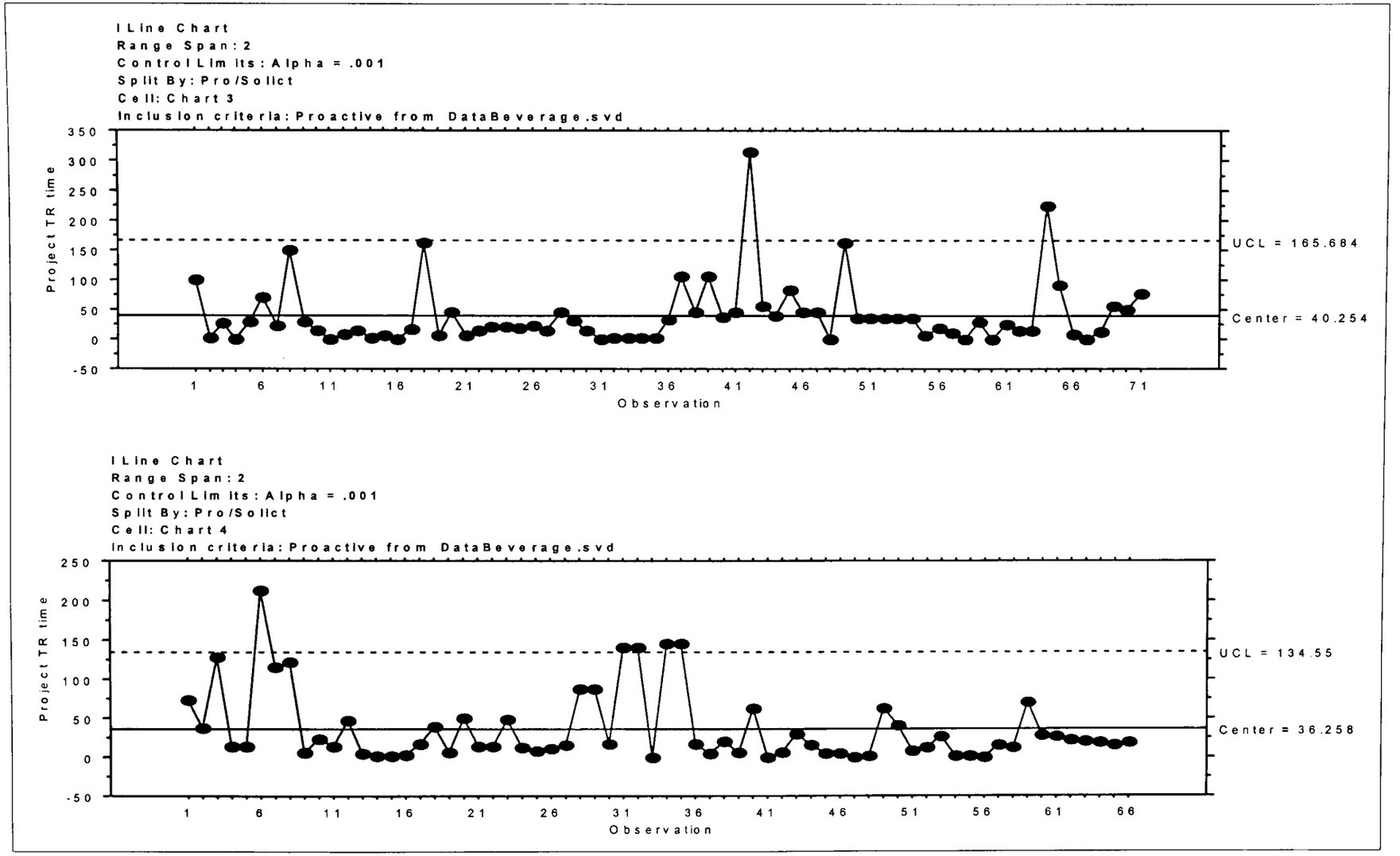

I Line Chart
Range Span: 2
Control Limits: Alpha = .001
Split By: Appl/Crea
Cell: Chart 1
Inclusion criteria: Collection from DataBeverage.svd
Project TR time
400
350
300
250
200
150
100
50
0
-50
1
6
11
16
21
26
31
36
41
46
51
56
61
66
71
Observation
UCL = 187.914
Center = 57.901
I Line Chart
Range Span: 2
Control Limits: Alpha = .001
Split By: Appl/Crea
Cell: Chart 2
Inclusion criteria: Collection from DataBeverage.svd
Project TR time
50
0
-50
1
6
11
16
21
26
31
36
Observation
UCL = 65.274
Center = 14.081
LCL = -37.111

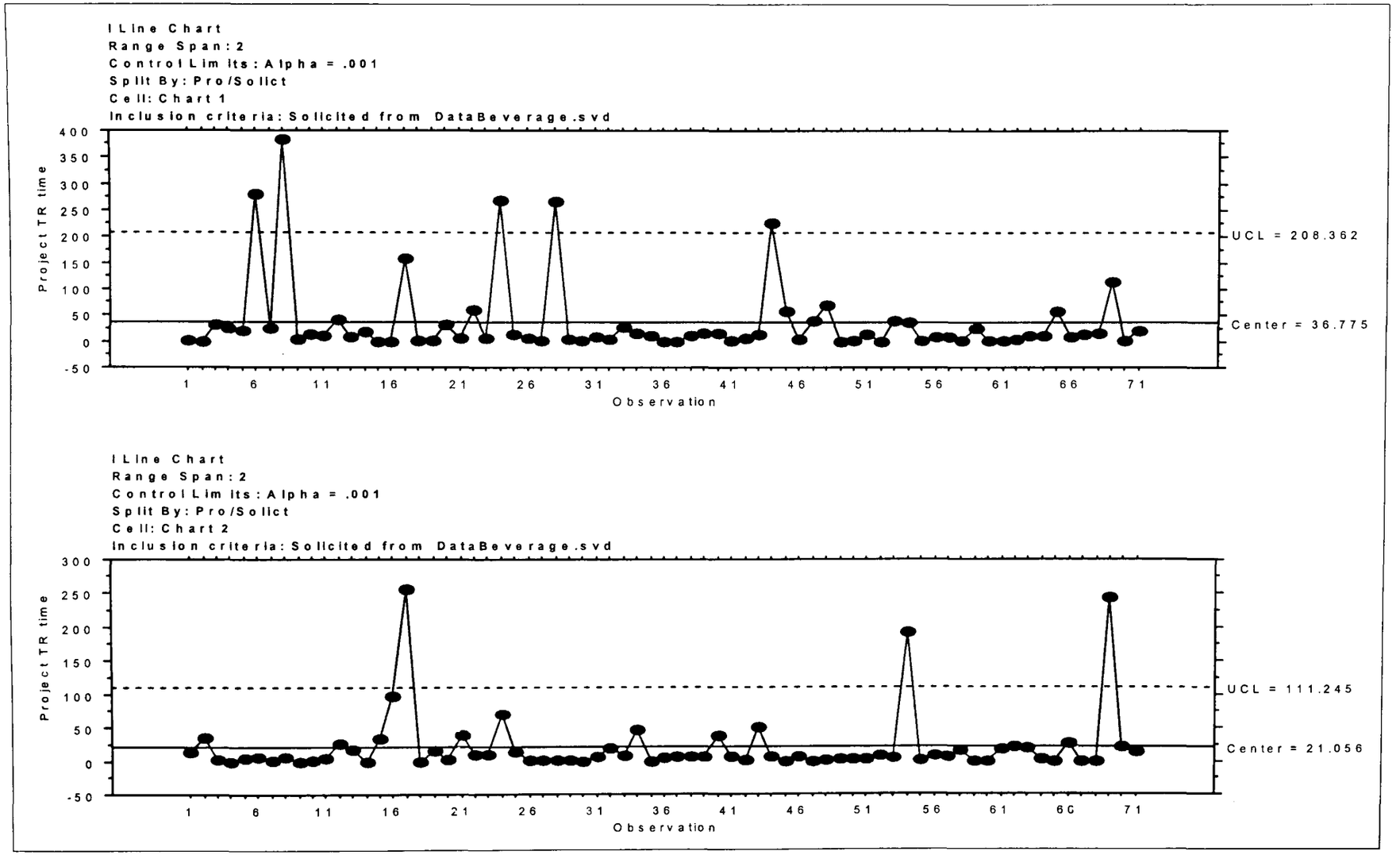

I Line Chart
Range Span: 2
Control Limits: Alpha = .001
Split By: Appl/Crea
Cell: Chart 1
Inclusion criteria: Creation from DataBeverage.svd
Project TR time
300
250
200
150
100
50
0
-50
1
6
11
16
21
26
31
36
41
46
51
56
61
66
71
Observation
UCL = 176.222
Center = 40.127
I Line Chart
Range Span: 2
Control Limits: Alpha = .001
Split By: Appl/Crea
Cell: Chart 2
Inclusion criteria: Creation from DataBeverage.svd
Project TR time
300
250
200
150
100
50
0
-50
1
6
11
16
21
26
31
36
41
46
51
56
61
66
71
Observation
UCL = 170.604
Center = 61.254
LCL = -48.097

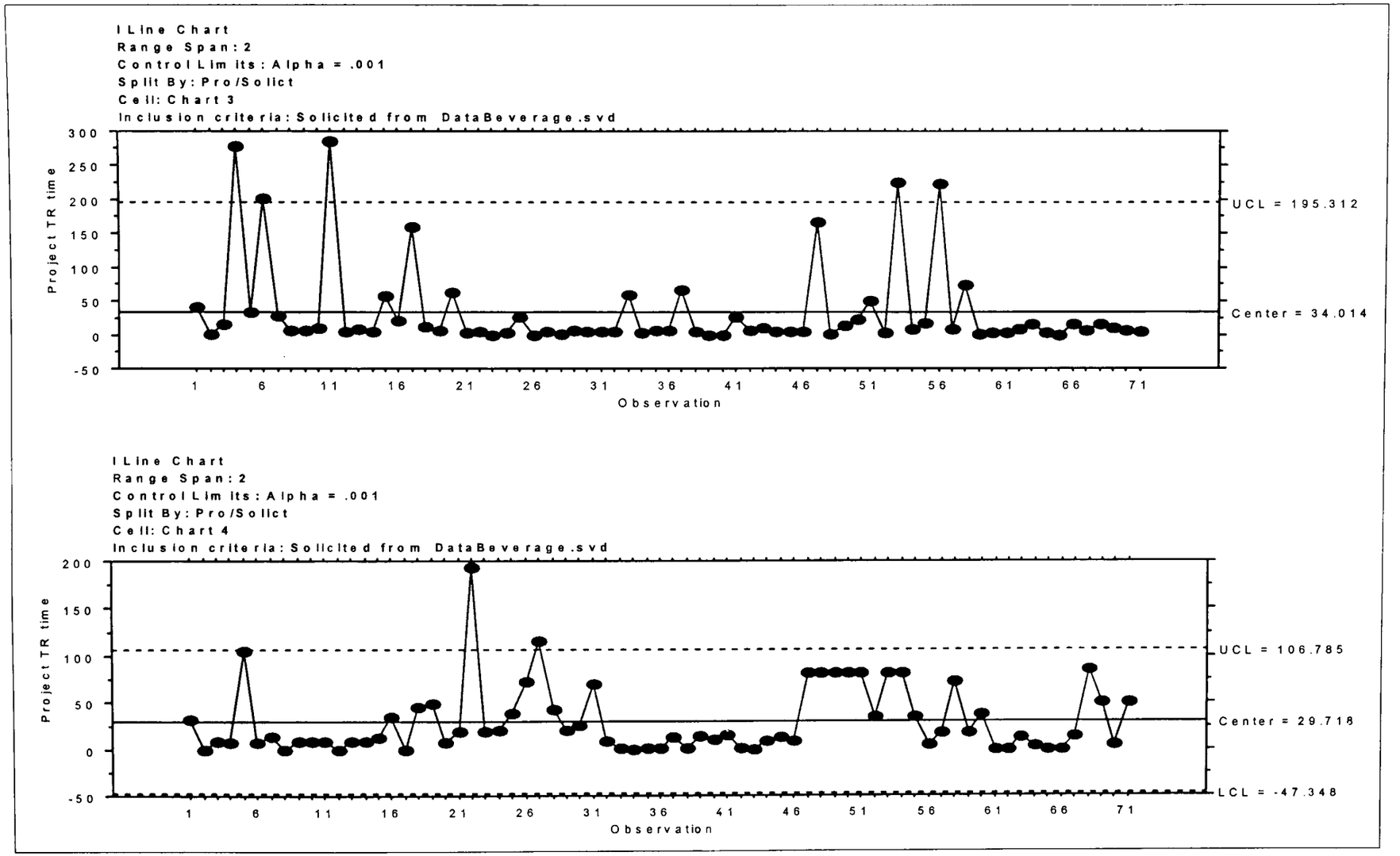

I Line Chart
Range Span: 2
Control Limits: Alpha = .001
Split By: Appl/Crea
Cell: Chart 3
Inclusion criteria: Creation from DataBeverage.svd
Project TR time
300
250
200
150
100
50
0
-50
UCL = 118.108
Center = 27.211
1
6
11
16
21
26
31
36
41
46
51
56
61
66
71
Observation
I Line Chart
Range Span: 2
Control Limits: Alpha = .001
Split By: Appl/Crea
Cell: Chart 4
Inclusion criteria: Creation from DataBeverage.svd
Project TR time
150
100
50
0
-50
UCL = 97.062
Center = 27.535
LCL = -41.991
1
6
11
16
21
26
31
36
41
46
51
56
61
66
71
Observation

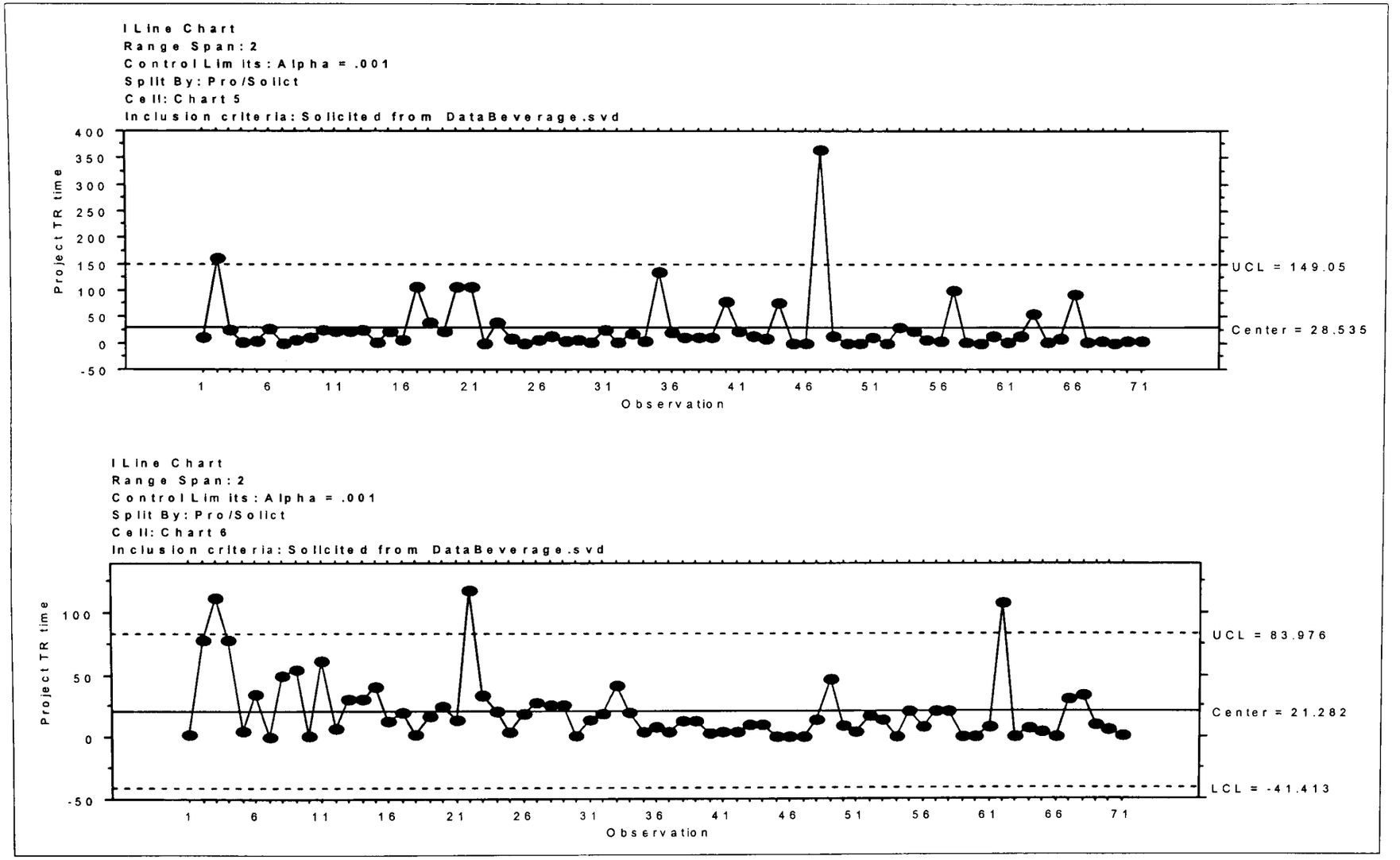

I Line Chart
Range Span: 2
Control Limits: Alpha = .001
Split By: Appl/Crea
Cell: Chart 5
Inclusion criteria: Creation from DataBeverage.svd
Project TR time
100
50
0
-50
UCL = 119.831
Center = 28.268
1
6
11
16
21
26
31
36
41
46
51
56
61
66
71
Observation
I Line Chart
Range Span: 2
Control Limits: Alpha = .001
Split By: Appl/Crea
Cell: Chart 6
Inclusion criteria: Creation from DataBeverage.svd
Project TR time
100
50
0
-50
UCL = 98.615
Center = 24.383
LCL = -49.849
1
6
11
16
21
26
31
36
41
46
Observation

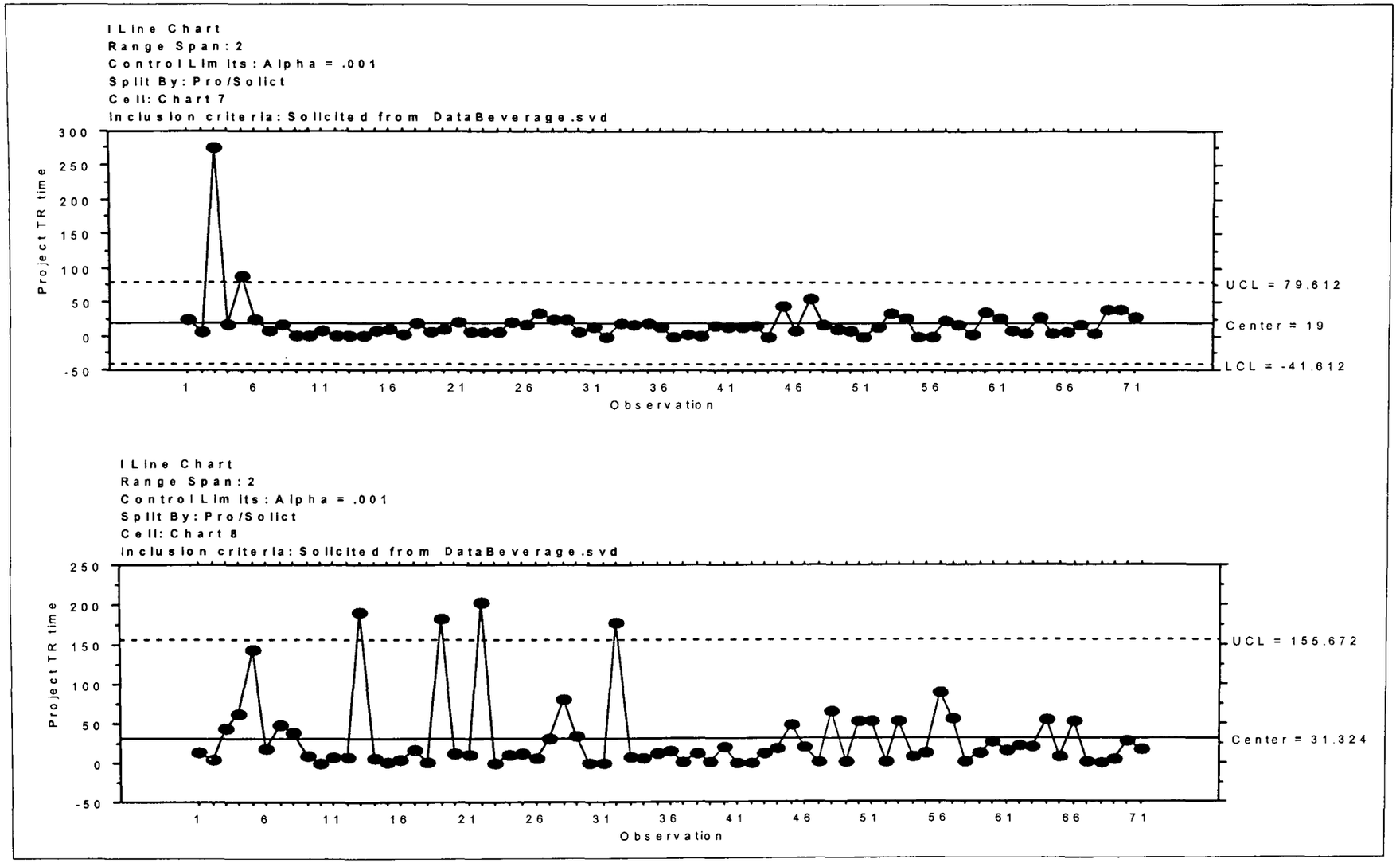

I Line Chart
Range Span: 2
Control Limits: Alpha = .001
Split By: Pro/Solict
Cell: Chart 1
Inclusion criteria: Proactive from DataBeverage.svd
Project TR time
300
250
200
150
100
50
0
-50
1
6
11
16
21
26
31
36
41
46
51
56
61
66
71
Observation
UCL = 213.197
Center = 61.563
I Line Chart
Range Span: 2
Control Limits: Alpha = .001
Split By: Pro/Solict
Cell: Chart 2
Inclusion criteria: Proactive from DataBeverage.svd
Project TR time
400
350
300
250
200
150
100
50
0
-50
1
6
11
16
21
26
31
36
41
46
51
56
61
66
71
Observation
UCL = 190.676
Center = 69.62

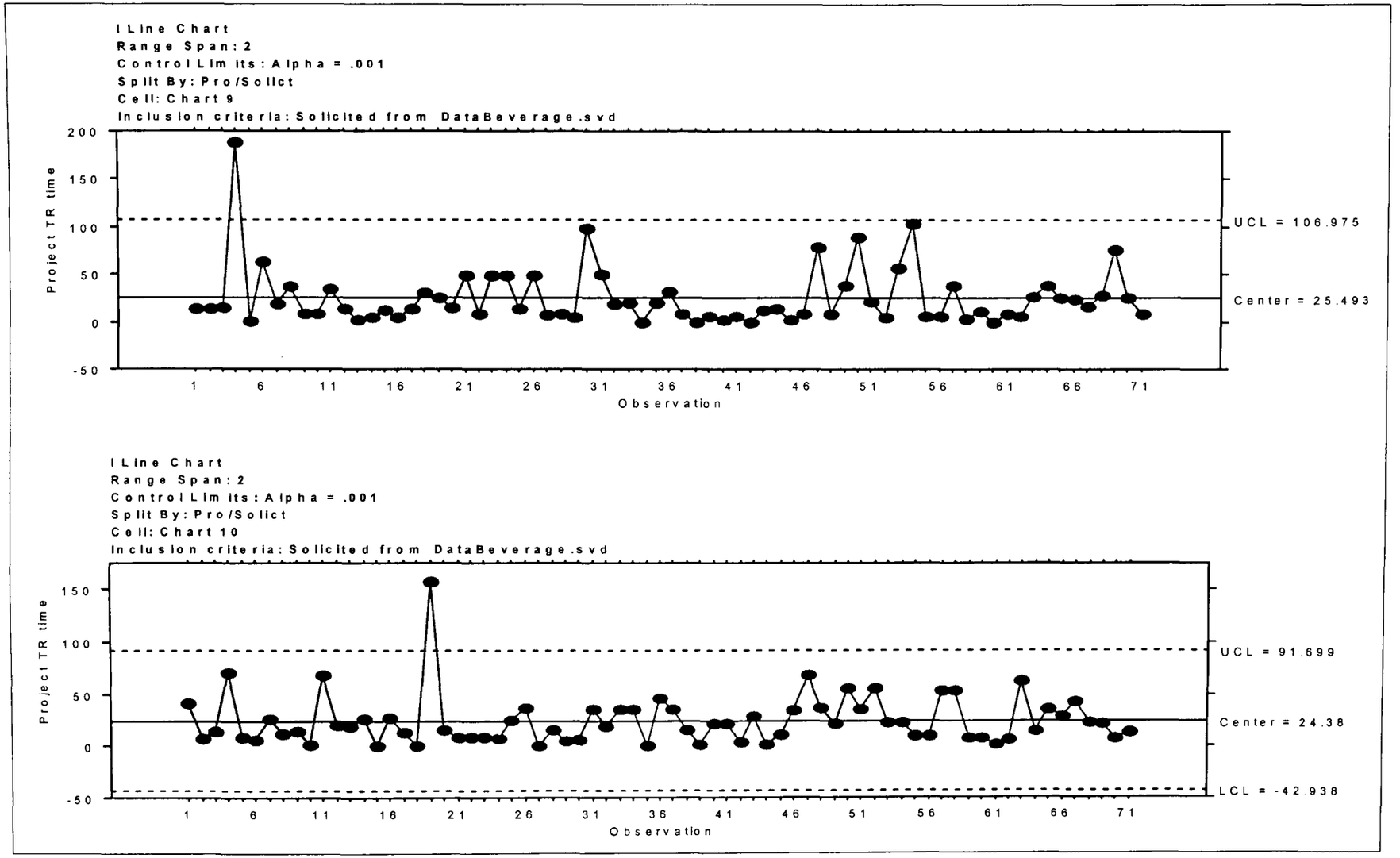

I Line Chart
Range Span: 2
Control Limits: Alpha = .001
Split By: Pro/Solict
Cell: Chart 3
Inclusion criteria: Proactive from DataBeverage.svd
Project TR time
350
300
250
200
150
100
50
0
-50
1
6
11
16
21
26
31
36
41
46
51
56
61
66
71
Observation
UCL = 165.684
Center = 40.254
I Line Chart
Range Span: 2
Control Limits: Alpha = .001
Split By: Pro/Solict
Cell: Chart 4
Inclusion criteria: Proactive from DataBeverage.svd
Project TR time
250
200
150
100
50
0
-50
1
6
11
16
21
26
31
36
41
46
51
56
61
66
Observation
UCL = 134.55
Center = 36.258

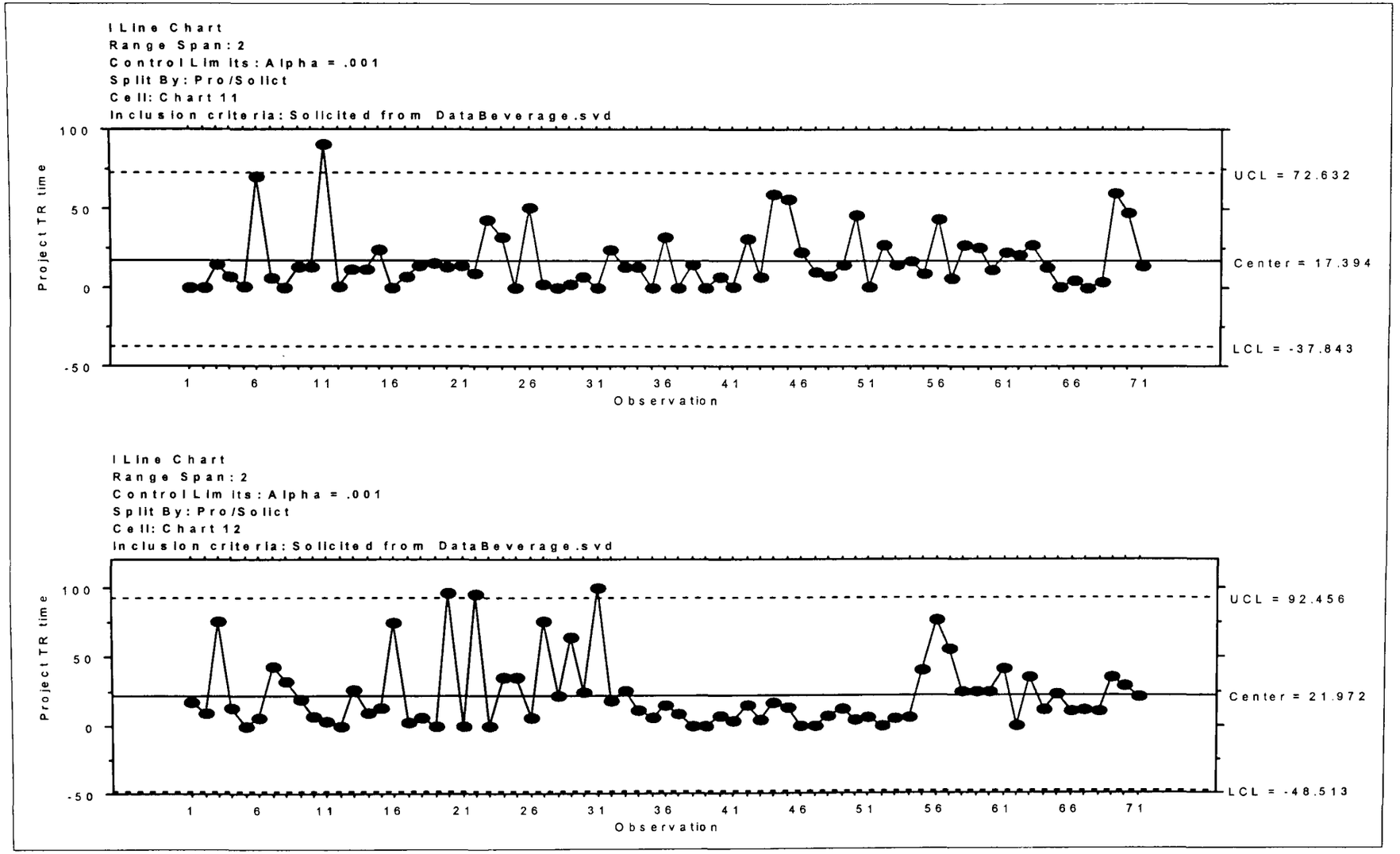

I Line Chart
Range Span: 2
Control Limits: Alpha = .001
Split By: Pro/Solict
Cell: Chart 1
Inclusion criteria: Solicited from DataBeverage.svd
Project TR time
400
350
300
250
200
150
100
50
0
-50
UCL = 208.362
Center = 36.775
1
6
11
16
21
26
31
36
41
46
51
56
61
66
71
Observation
I Line Chart
Range Span: 2
Control Limits: Alpha = .001
Split By: Pro/Solict
Cell: Chart 2
Inclusion criteria: Solicited from DataBeverage.svd
Project TR time
300
250
200
150
100
50
0
-50
UCL = 111.245
Center = 21.056
1
6
11
16
21
26
31
36
41
46
51
56
61
66
71
Observation

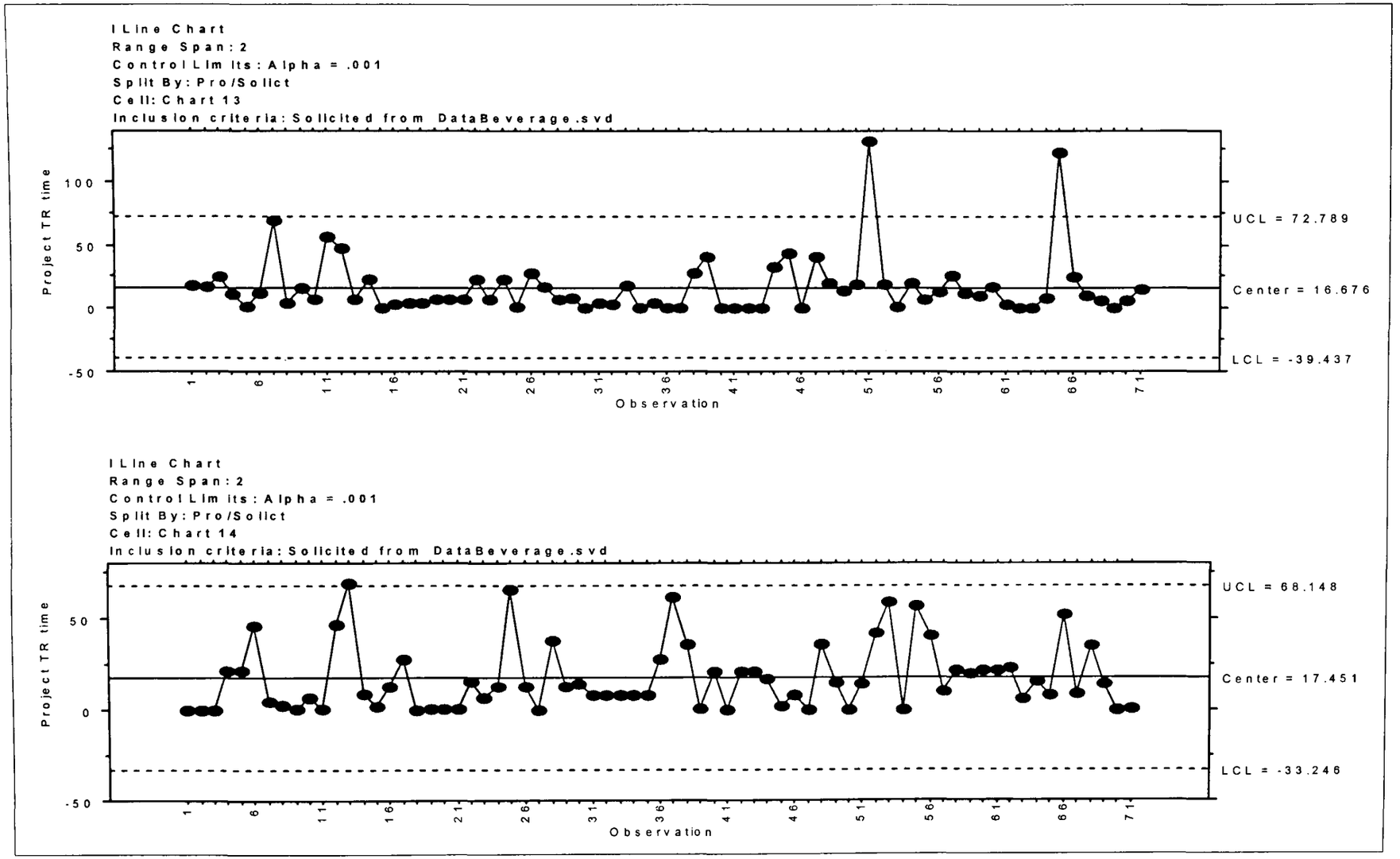

I Line Chart
Range Span: 2
Control Limits: Alpha = .001
Split By: Pro/Solict
Cell: Chart 3
Inclusion criteria: Solicited from DataBeverage.svd
Project TR time
300
250
200
150
100
50
0
-50
1
6
11
16
21
26
31
36
41
46
51
56
61
66
71
Observation
UCL = 195.312
Center = 34.014
I Line Chart
Range Span: 2
Control Limits: Alpha = .001
Split By: Pro/Solict
Cell: Chart 4
Inclusion criteria: Solicited from DataBeverage.svd
Project TR time
200
150
100
50
0
-50
1
6
11
16
21
26
31
36
41
46
51
56
61
66
71
Observation
UCL = 106.785
Center = 29.718
LCL = -47.348

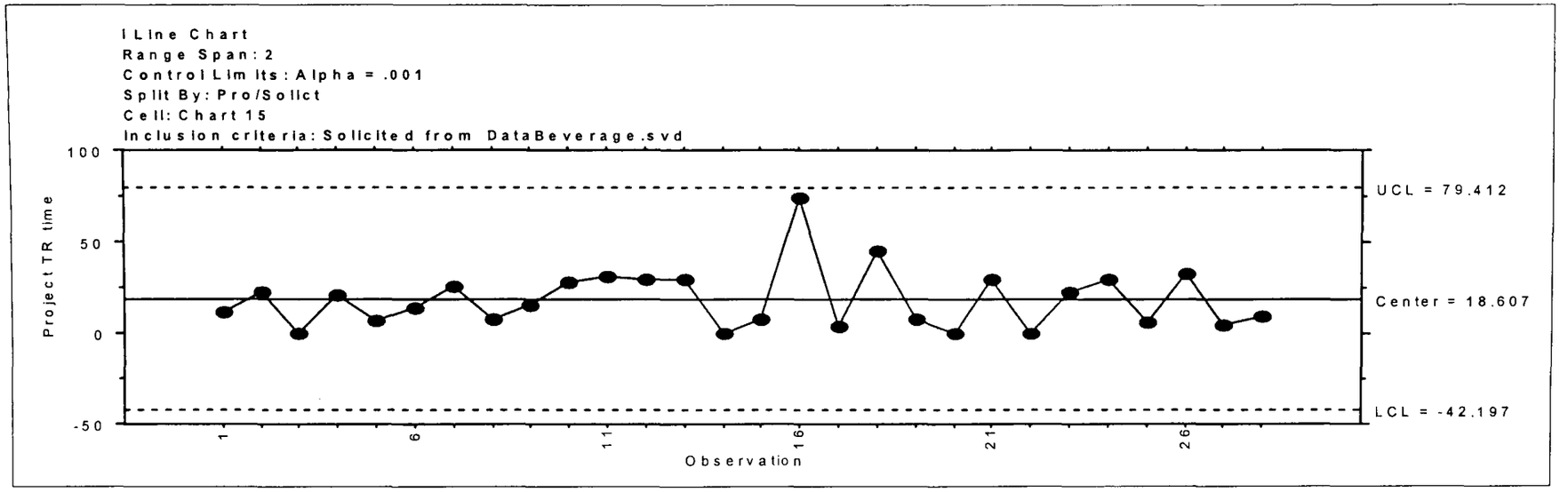

I Line Chart
Range Span: 2
Control Limits: Alpha = .001
Split By: Pro/Solict
Cell: Chart 5
Inclusion criteria: Solicited from DataBeverage.svd
Project TR time
400
350
300
250
200
150
100
50
0
-50
UCL = 149.05
Center = 28.535
1
6
11
16
21
26
31
36
41
46
51
56
61
66
71
Observation
I Line Chart
Range Span: 2
Control Limits: Alpha = .001
Split By: Pro/Solict
Cell: Chart 6
Inclusion criteria: Solicited from DataBeverage.svd
Project TR time
100
50
0
-50
UCL = 83.976
Center = 21.282
LCL = -41.413
1
6
11
16
21
26
31
36
41
46
51
56
61
66
71
Observation


I Line Chart
Range Span: 2
Control Limits: Alpha = .001
Split By: Pro/Solict
Cell: Chart 7
Inclusion criteria: Solicited from DataBeverage.svd
Project TR time
300
250
200
150
100
50
0
-50
1
6
11
16
21
26
31
36
41
46
51
56
61
66
71
Observation
UCL = 79.612
Center = 19
LCL = -41.612
I Line Chart
Range Span: 2
Control Limits: Alpha = .001
Split By: Pro/Solict
Cell: Chart 8
Inclusion criteria: Solicited from DataBeverage.svd
Project TR time
250
200
150
100
50
0
-50
1
6
11
16
21
26
31
36
41
46
51
56
61
66
71
Observation
UCL = 155.672
Center = 31.324


I Line Chart
Range Span: 2
Control Limits: Alpha = .001
Split By: Pro/Solict
Cell: Chart 9
Inclusion criteria: Solicited from DataBeverage.svd
Project TR time
200
150
100
50
0
-50
UCL = 106.975
Center = 25.493
1
6
11
16
21
26
31
36
41
46
51
56
61
66
71
Observation
I Line Chart
Range Span: 2
Control Limits: Alpha = .001
Split By: Pro/Solict
Cell: Chart 10
Inclusion criteria: Solicited from DataBeverage.svd
Project TR time
150
100
50
0
-50
UCL = 91.699
Center = 24.38
LCL = -42.938
1
6
11
16
21
26
31
36
41
46
51
56
61
66
71
Observation


I Line Chart
Range Span: 2
Control Limits: Alpha = .001
Split By: Pro/Solict
Cell: Chart 11
Inclusion criteria: Solicited from DataBeverage.svd
Project TR time
100
50
0
-50
UCL = 72.632
Center = 17.394
LCL = -37.843
1 6 11 16 21 26 31 36 41 46 51 56 61 66 71
Observation
I Line Chart
Range Span: 2
Control Limits: Alpha = .001
Split By: Pro/Solict
Cell: Chart 12
Inclusion criteria: Solicited from DataBeverage.svd
Project TR time
100
50
0
-50
UCL = 92.456
Center = 21.972
LCL = -48.513
1 6 11 16 21 26 31 36 41 46 51 56 61 66 71
Observation


I Line Chart
Range Span: 2
Control Limits: Alpha = .001
Split By: Pro/Solict
Cell: Chart 13
Inclusion criteria: Solicited from DataBeverage.svd
Project TR time
100
50
0
-50
UCL = 72.789
Center = 16.676
LCL = -39.437
1
6
11
16
21
26
31
36
41
46
51
56
61
66
71
Observation
I Line Chart
Range Span: 2
Control Limits: Alpha = .001
Split By: Pro/Solict
Cell: Chart 14
Inclusion criteria: Solicited from DataBeverage.svd
Project TR time
50
0
-50
UCL = 68.148
Center = 17.451
LCL = -33.246
1
6
11
16
21
26
31
36
41
46
51
56
61
66
71
Observation

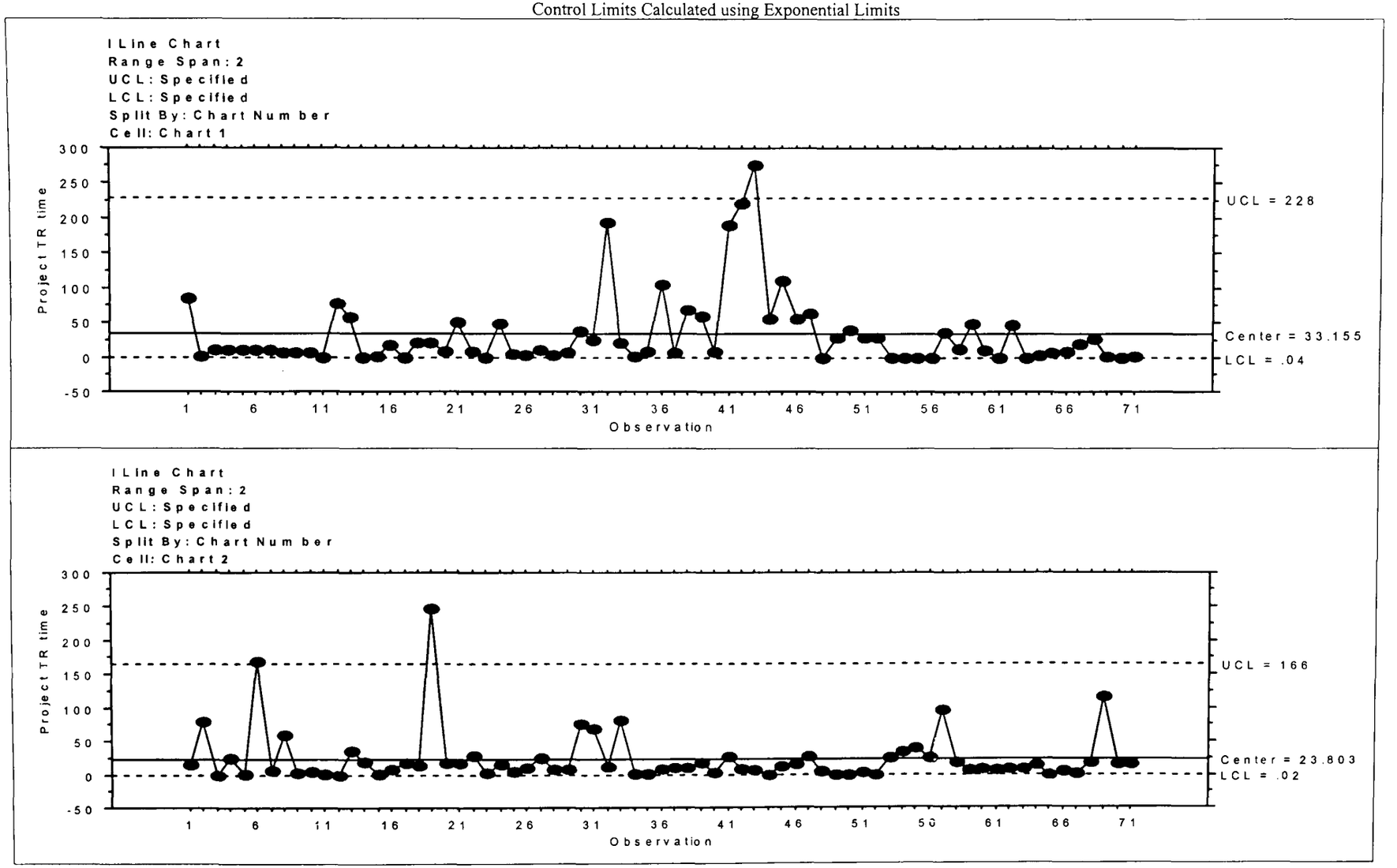

I Line Chart
Range Span: 2
Control Limits: Alpha = .001
Split By: Pro/Solict
Cell: Chart 15
Inclusion criteria: Solicited from DataBeverage.svd
100
50
0
-50
Project TR time
UCL = 79.412
Center = 18.607
LCL = -42.197
1
6
11
16
21
26
Observation

Appendix 14

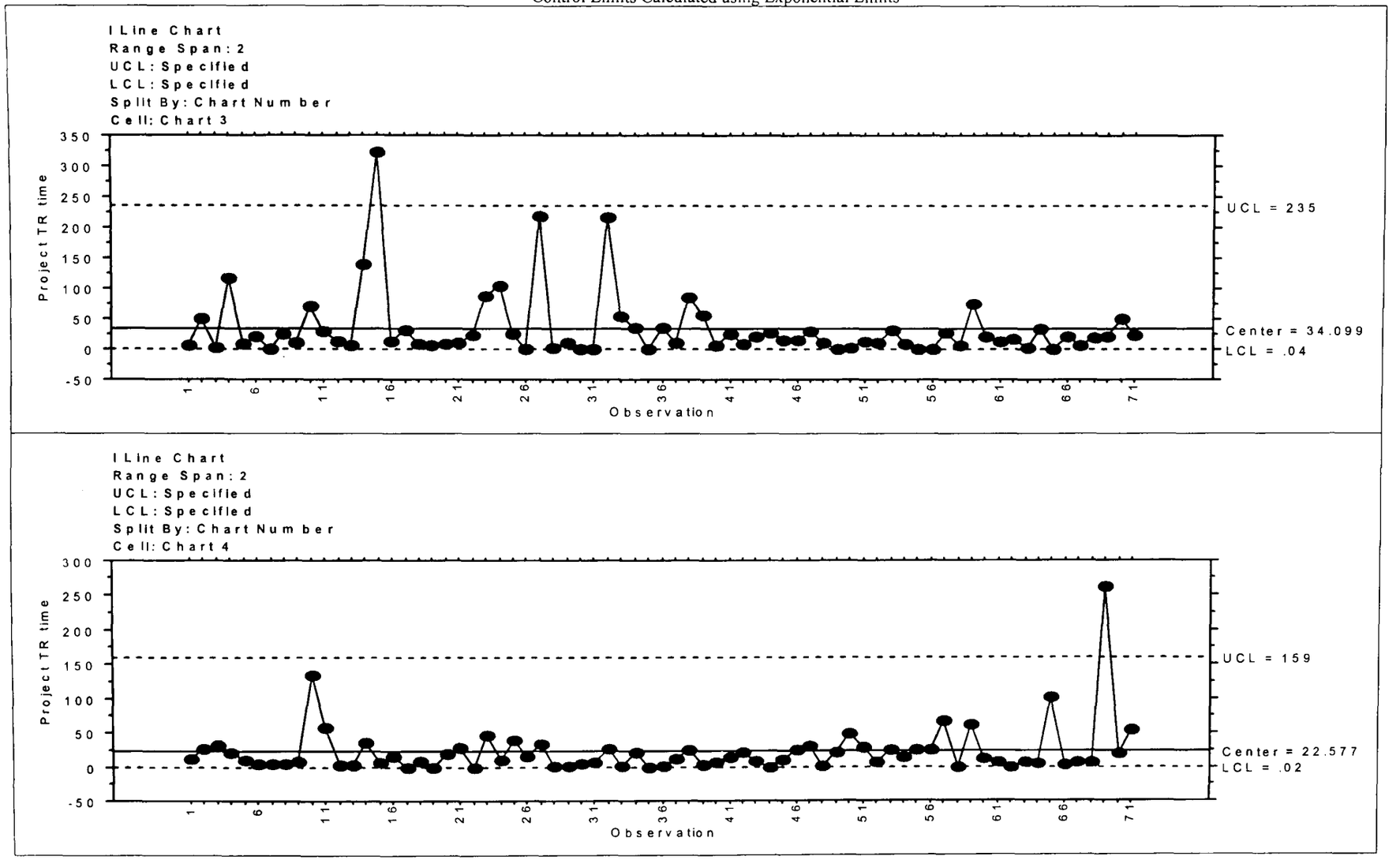
Control Charts for the Exponential Limits Approach

Confectionery BU

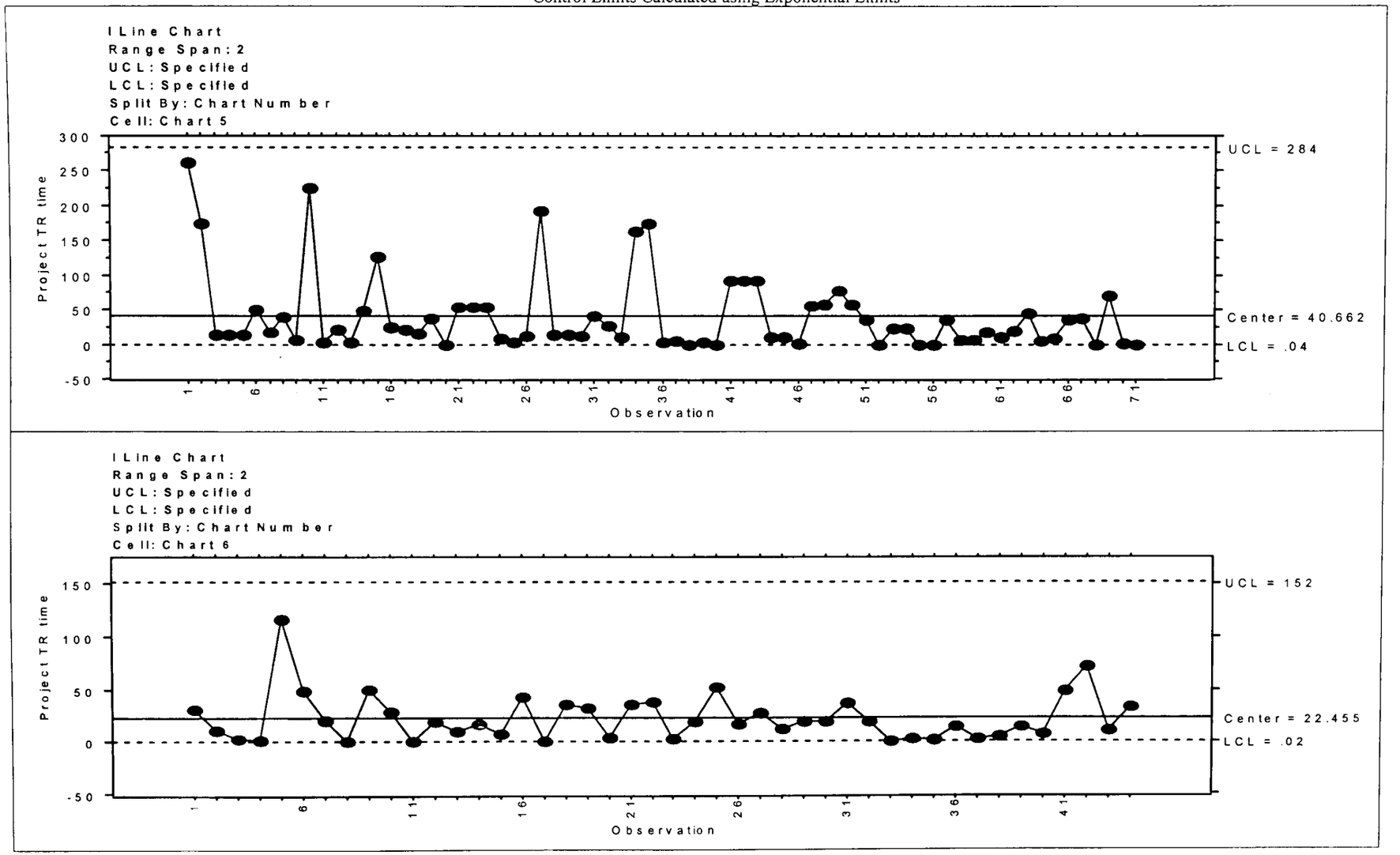
Confectionery BU - All Projects
Control Limits Calculated using Exponential Limits

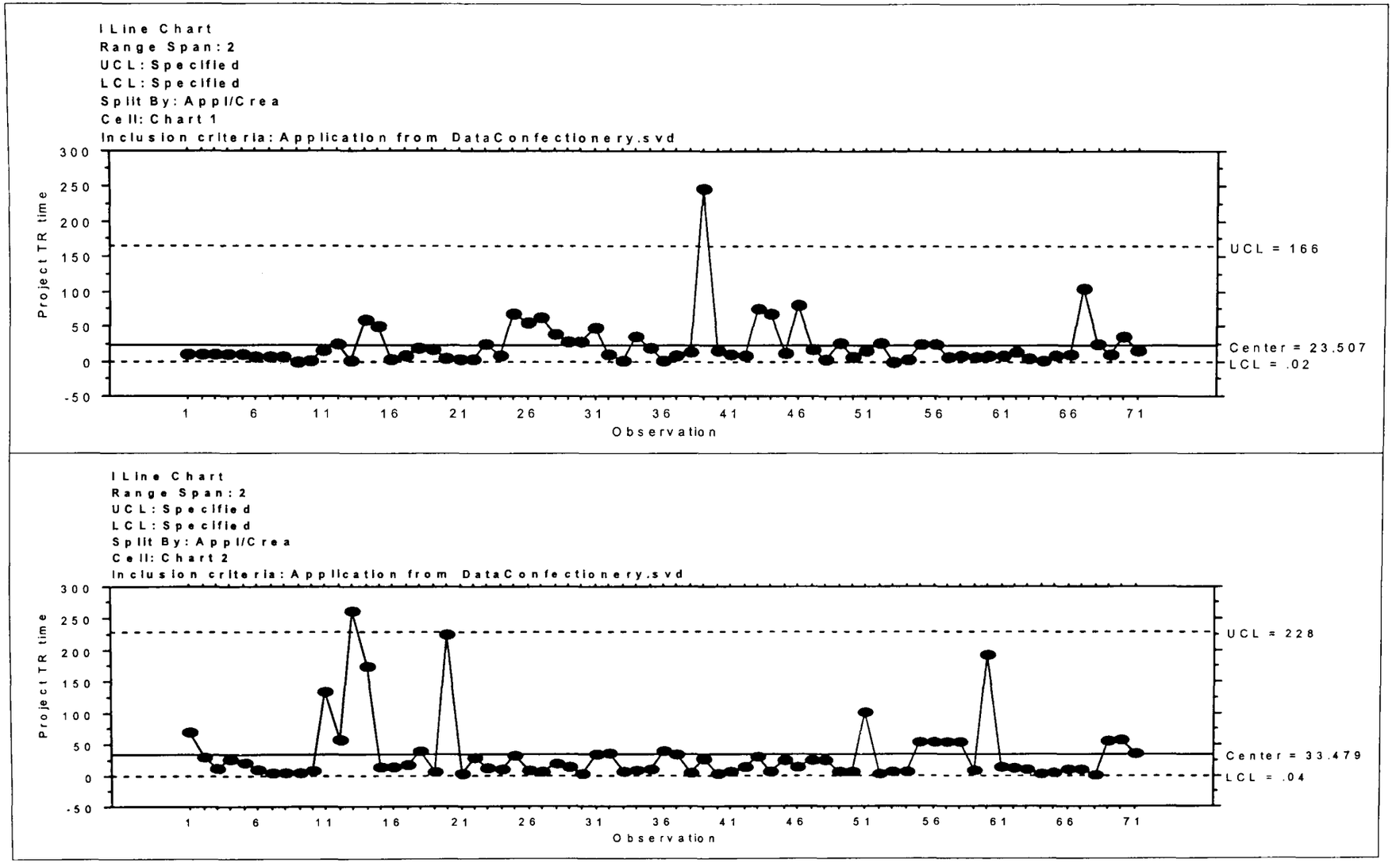


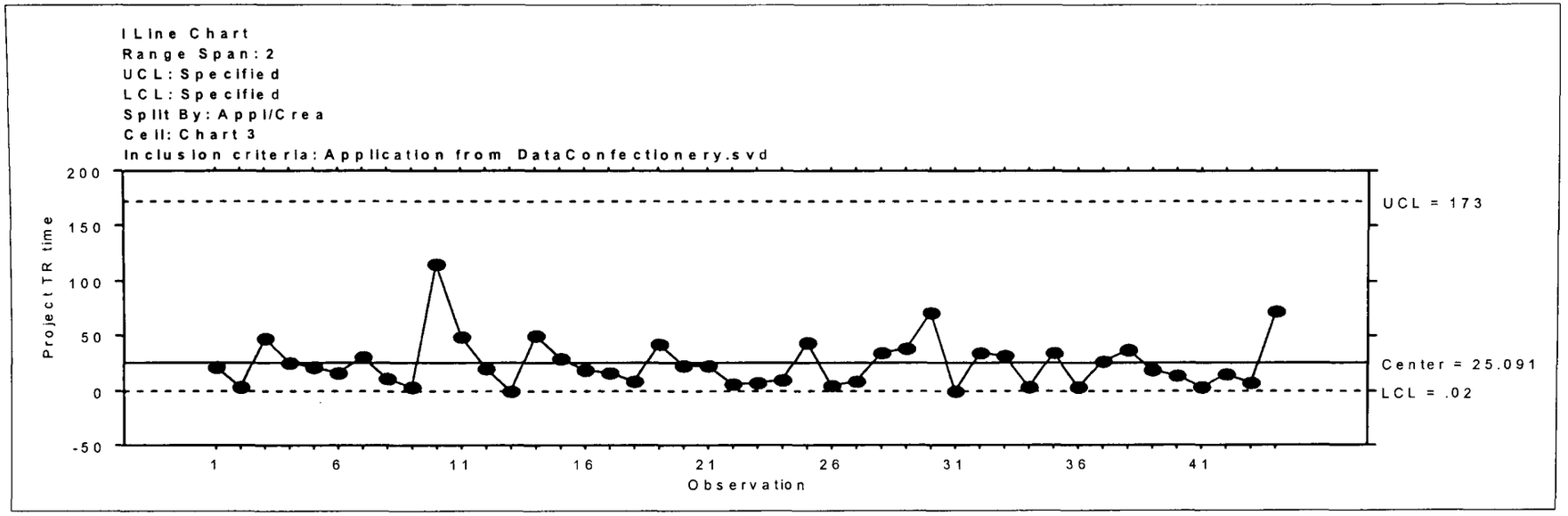
Confectionery BU - All Projects
Control Limits Calculated using Exponential Limits

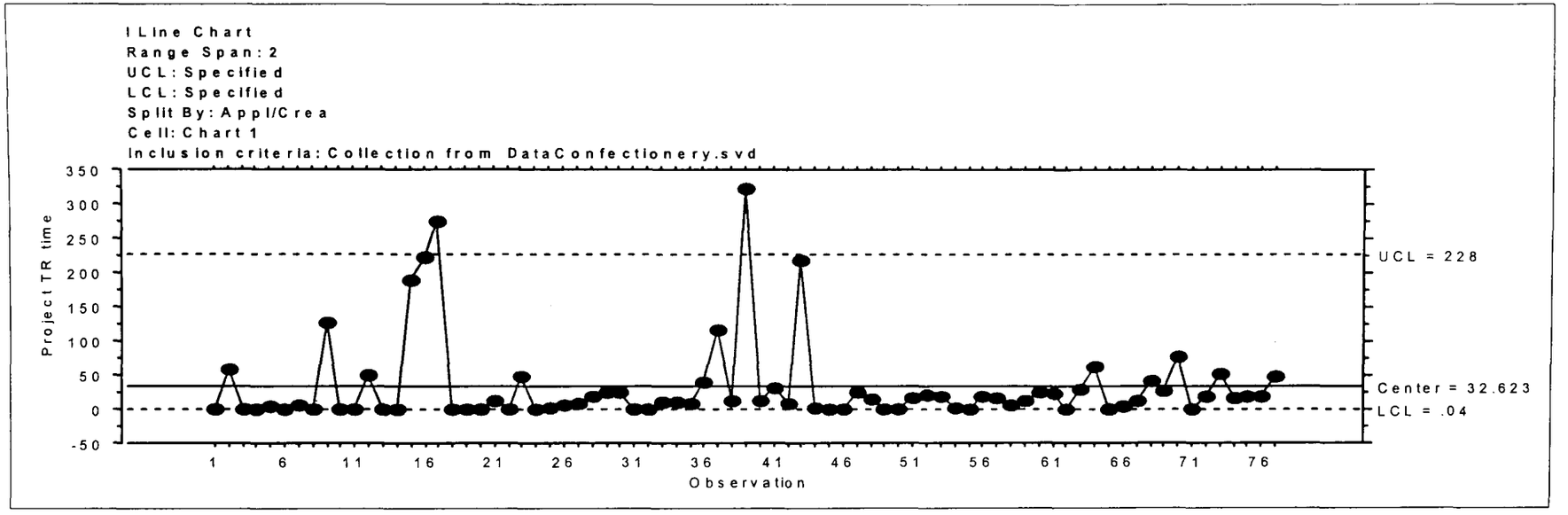


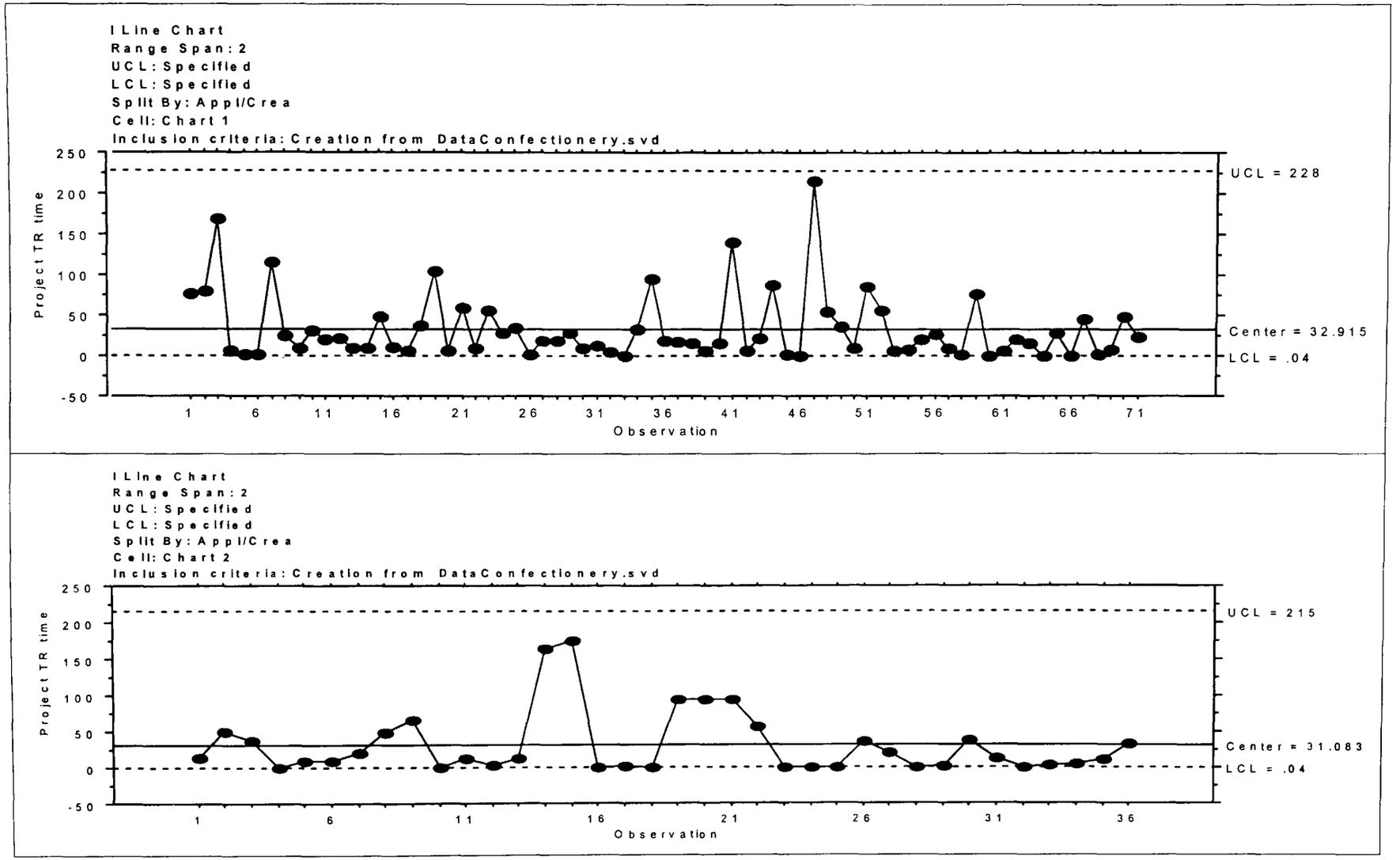
Confectionery BU - All Projects
Control Limits Calculated using Exponential Limits

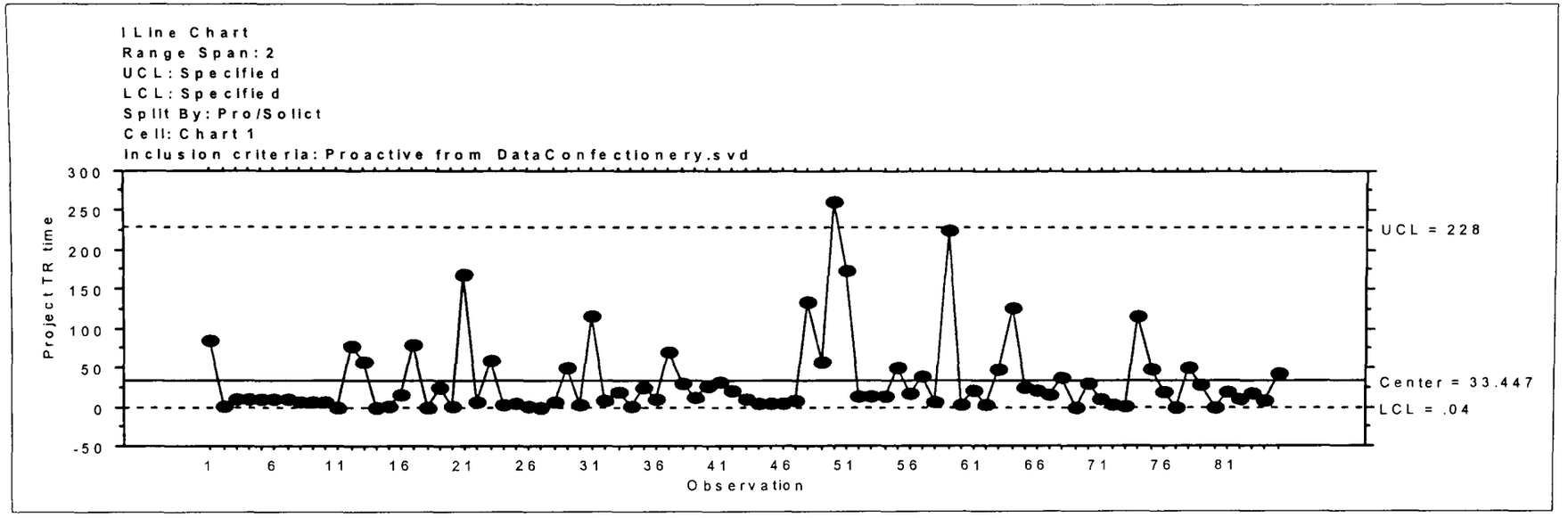


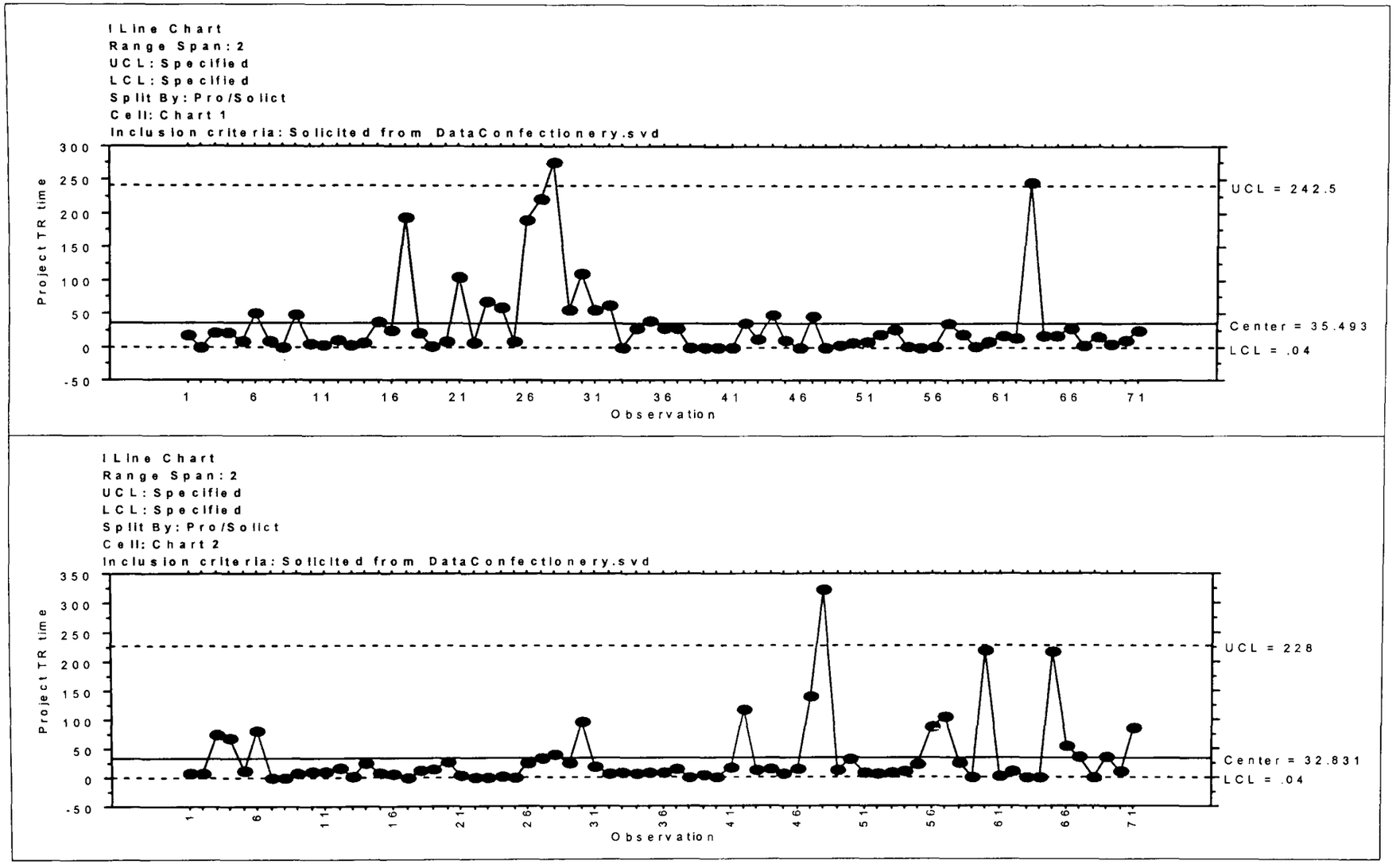

I Line Chart
Range Span: 2
UCL: Specified
LCL: Specified
Split By: Appl/Crea
Cell: Chart 1
Inclusion criteria: Application from DataConfectionery.svd
Project TR time
300
250
200
150
100
50
0
-50
1
6
11
16
21
26
31
36
41
46
51
56
61
66
71
Observation
UCL = 166
Center = 23.507
LCL = .02
I Line Chart
Range Span: 2
UCL: Specified
LCL: Specified
Split By: Appl/Crea
Cell: Chart 2
Inclusion criteria: Application from DataConfectionery.svd
Project TR time
300
250
200
150
100
50
0
-50
1
6
11
16
21
26
31
36
41
46
51
56
61
66
71
Observation
UCL = 228
Center = 33.479
LCL = .04

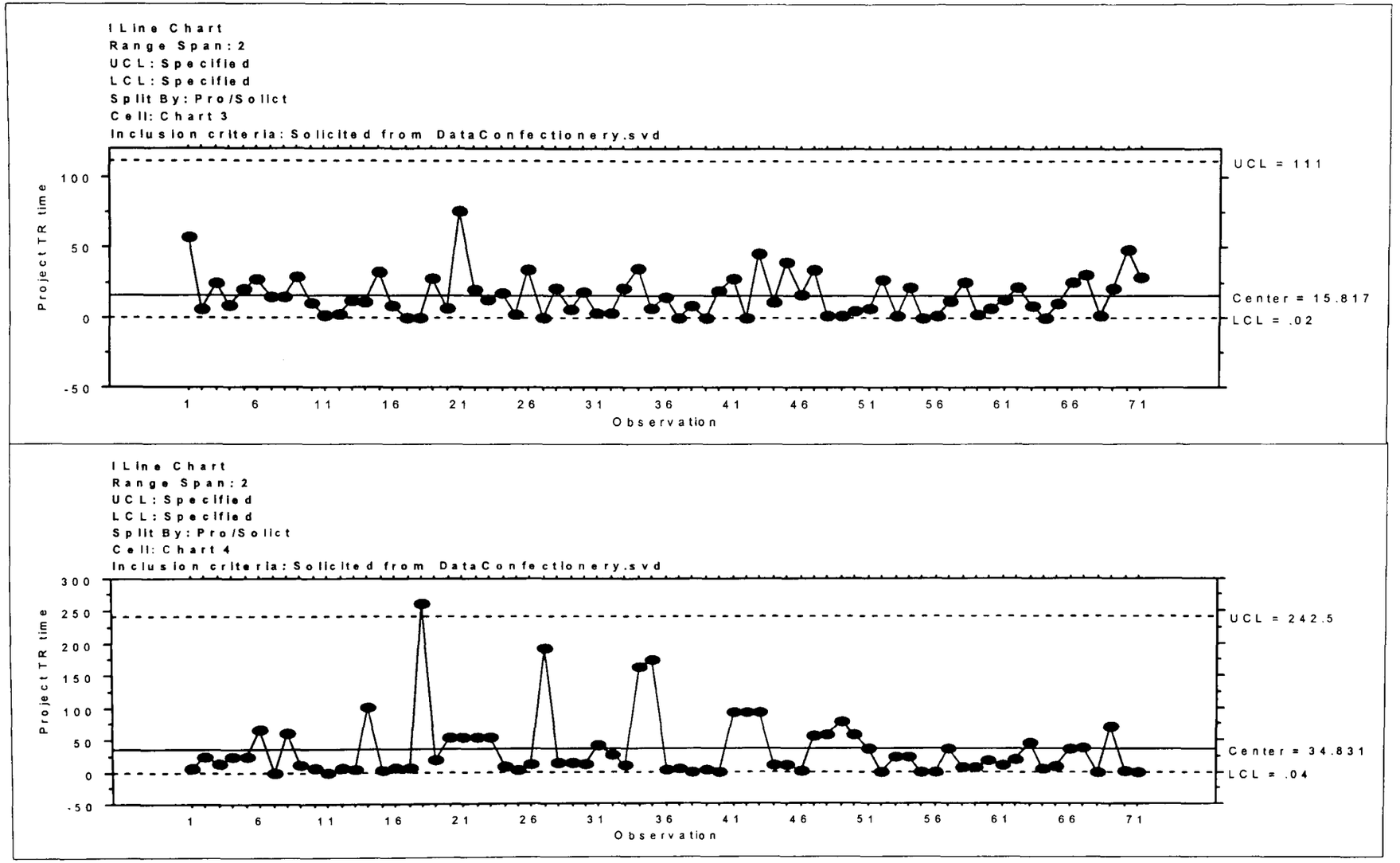

I Line Chart
Range Span: 2
UCL: Specified
LCL: Specified
Split By: Appl/Crea
Cell: Chart 3
Inclusion criteria: Application from DataConfectionery.svd
Project TR time
200
150
100
50
0
-50
1
6
11
16
21
26
31
36
41
Observation
UCL = 173
Center = 25.091
LCL = .02

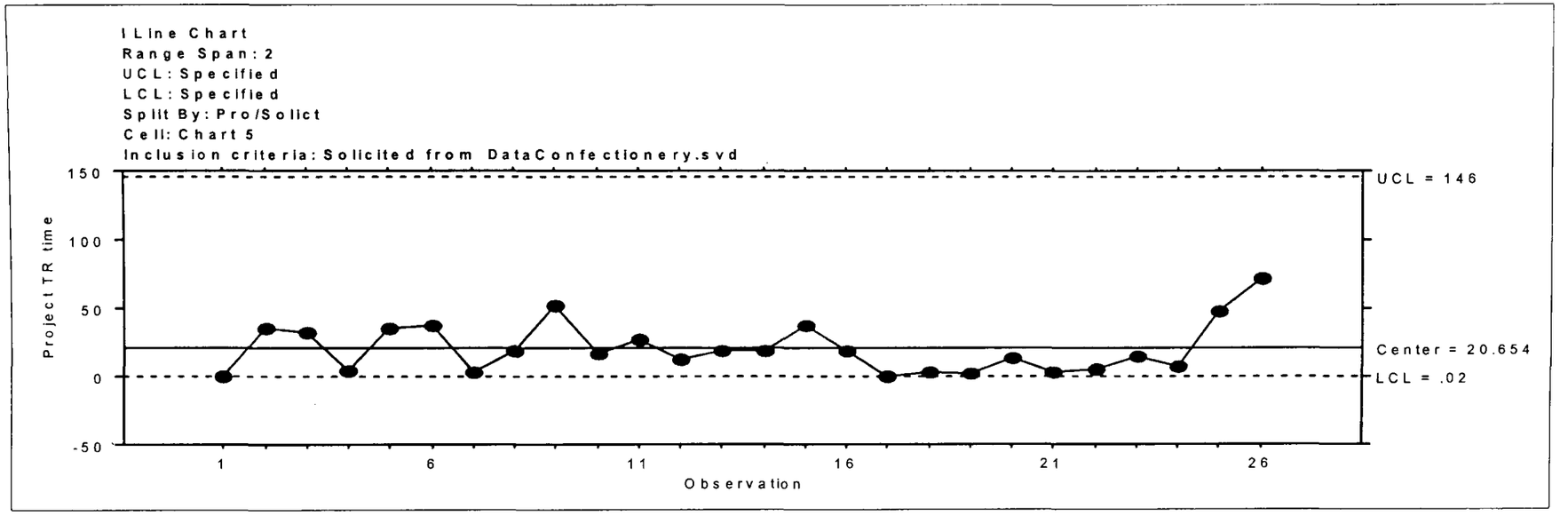

I Line Chart
Range Span: 2
UCL: Specified
LCL: Specified
Split By: Appl/Crea
Cell: Chart 1
Inclusion criteria: Collection from DataConfectionery.svd
Project TR time
350
300
250
200
150
100
50
0
-50
1
6
11
16
21
26
31
36
41
46
51
56
61
66
71
76
Observation
UCL = 228
Center = 32.623
LCL = .04


I LIne Chart
Range Span: 2
UCL: Specified
LCL: Specified
Split By: Appl/Crea
Cell: Chart 1
Inclusion criteria: Creation from DataConfectionery.svd
Project TR time
250
200
150
100
50
0
-50
1
6
11
16
21
26
31
36
41
46
51
56
61
66
71
Observation
UCL = 228
Center = 32.915
LCL = .04
I LIne Chart
Range Span: 2
UCL: Specified
LCL: Specified
Split By: Appl/Crea
Cell: Chart 2
Inclusion criteria: Creation from DataConfectionery.svd
Project TR time
250
200
150
100
50
0
-50
1
6
11
16
21
26
31
36
Observation
UCL = 215
Center = 31.083
LCL = .04


I Line Chart
Range Span: 2
UCL: Specified
LCL: Specified
Split By: Pro/Solict
Cell: Chart 1
Inclusion criteria: Proactive from DataConfectionery.svd
Project TR time
300
250
200
150
100
50
0
-50
1
6
11
16
21
26
31
36
41
46
51
56
61
66
71
76
81
Observation
UCL = 228
Center = 33.447
LCL = .04


I Line Chart
Range Span: 2
UCL: Specified
LCL: Specified
Split By: Pro/Solict
Cell: Chart 1
Inclusion criteria: Solicited from DataConfectionery.svd
Project TR time
300
250
200
150
100
50
0
-50
UCL = 242.5
Center = 35.493
LCL = .04
1
6
11
16
21
26
31
36
41
46
51
56
61
66
71
Observation
I Line Chart
Range Span: 2
UCL: Specified
LCL: Specified
Split By: Pro/Solict
Cell: Chart 2
Inclusion criteria: Solicited from DataConfectionery.svd
Project TR time
350
300
250
200
150
100
50
0
-50
UCL = 228
Center = 32.831
LCL = .04
Observation


I Line Chart
Range Span: 2
UCL: Specified
LCL: Specified
Split By: Pro/Solict
Cell: Chart 3
Inclusion criteria: Solicited from DataConfectionery.svd
Project TR time
100
50
0
-50
UCL = 111
Center = 15.817
LCL = .02
1
6
11
16
21
26
31
36
41
46
51
56
61
66
71
Observation
I Line Chart
Range Span: 2
UCL: Specified
LCL: Specified
Split By: Pro/Solict
Cell: Chart 4
Inclusion criteria: Solicited from DataConfectionery.svd
Project TR time
300
250
200
150
100
50
0
-50
UCL = 242.5
Center = 34.831
LCL = .04
1
6
11
16
21
26
31
36
41
46
51
56
61
66
71
Observation


I LIne Chart
Range Span: 2
UCL: Specified
LCL: Specified
Split By: Pro/Solict
Cell: Chart 5
Inclusion criteria: Solicited from DataConfectionery.svd
150
100
50
0
-50
Project TR time
1
6
11
16
21
26
Observation
UCL = 146
Center = 20.654
LCL = .02

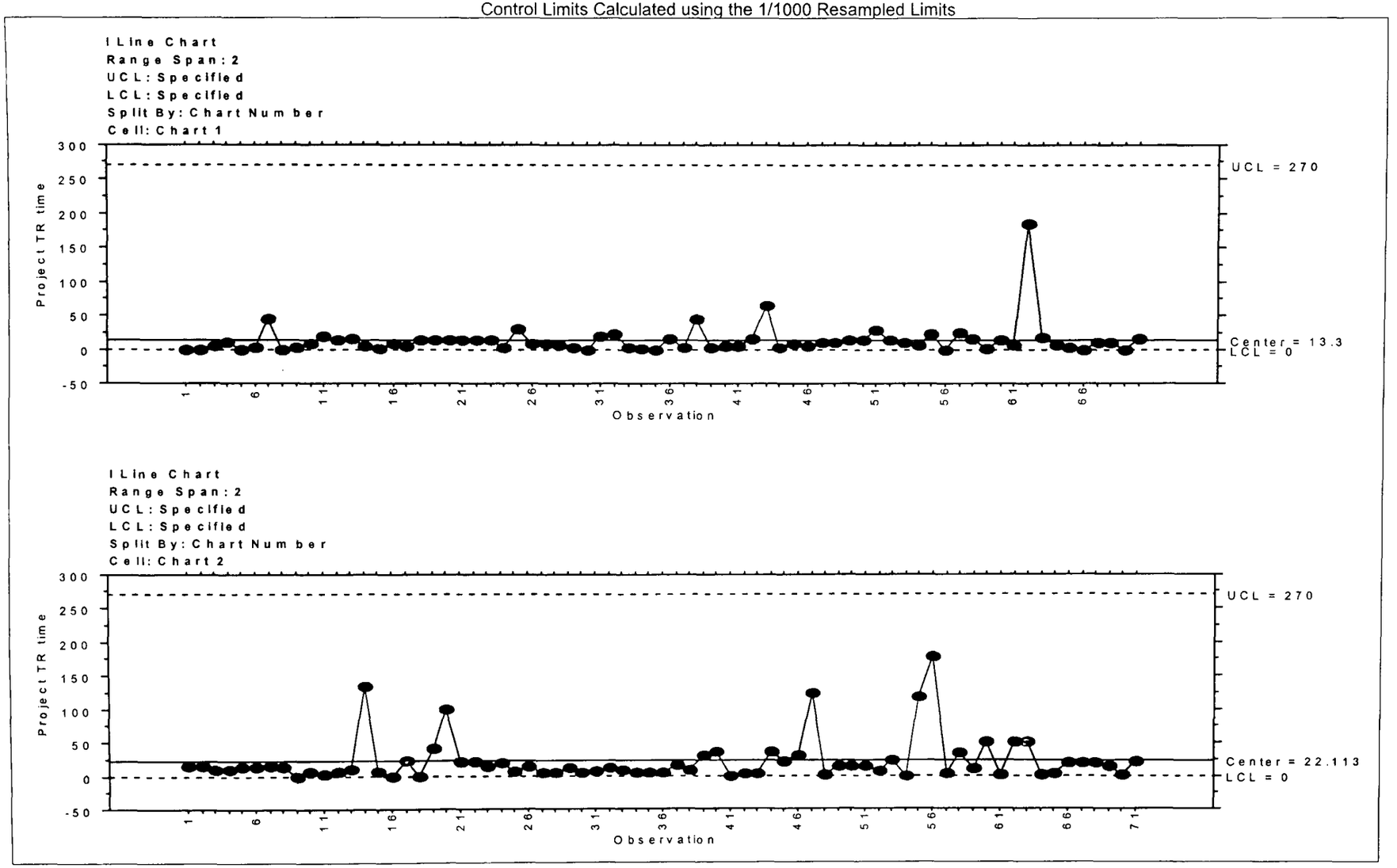
Appendix 15

Control Charts or the 1/1000 Resampled Probability Limits

Dairy BU

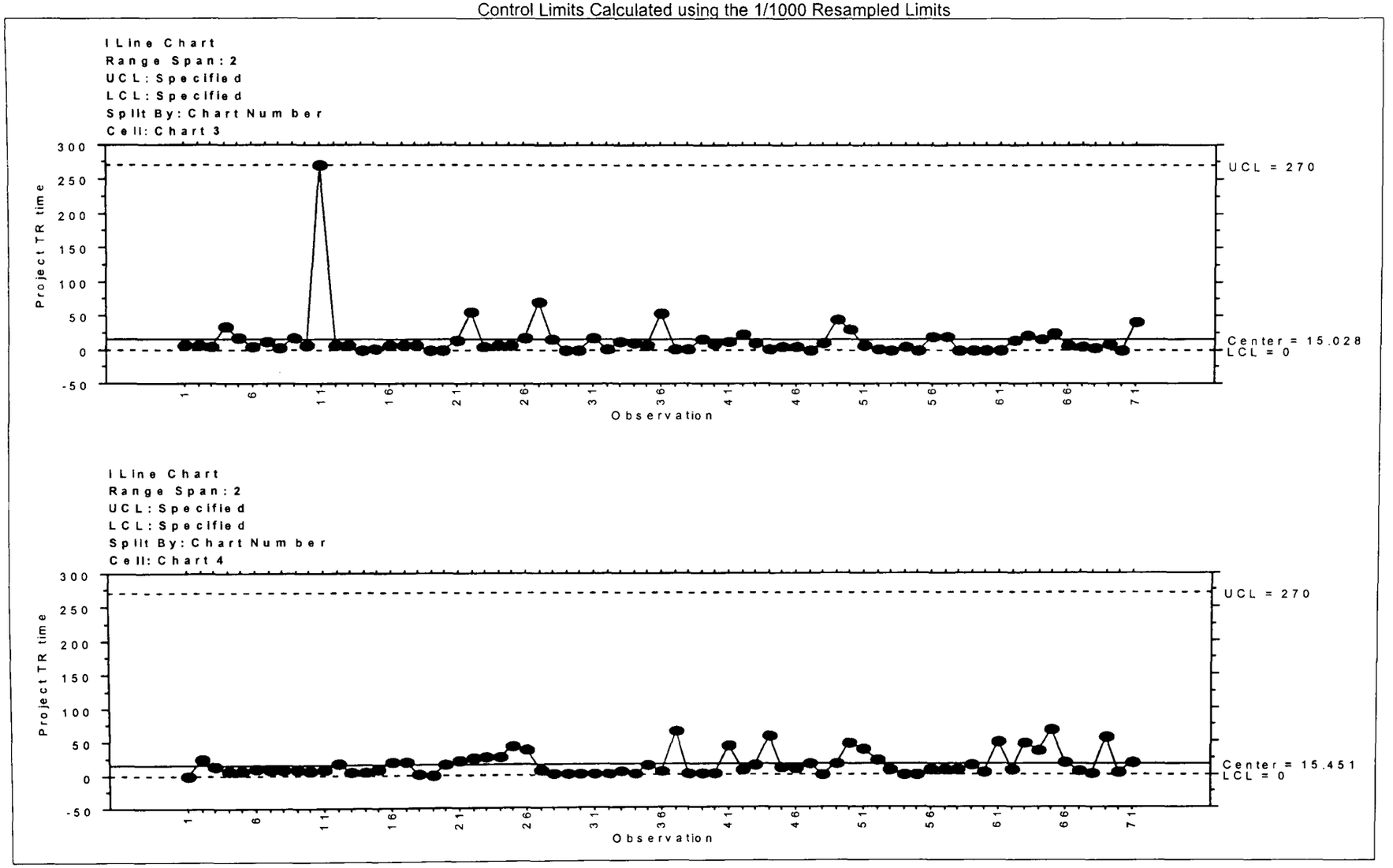
Dairy BU - All Projects

Control Limits Calculated using the 1/1000 Resampled Limits

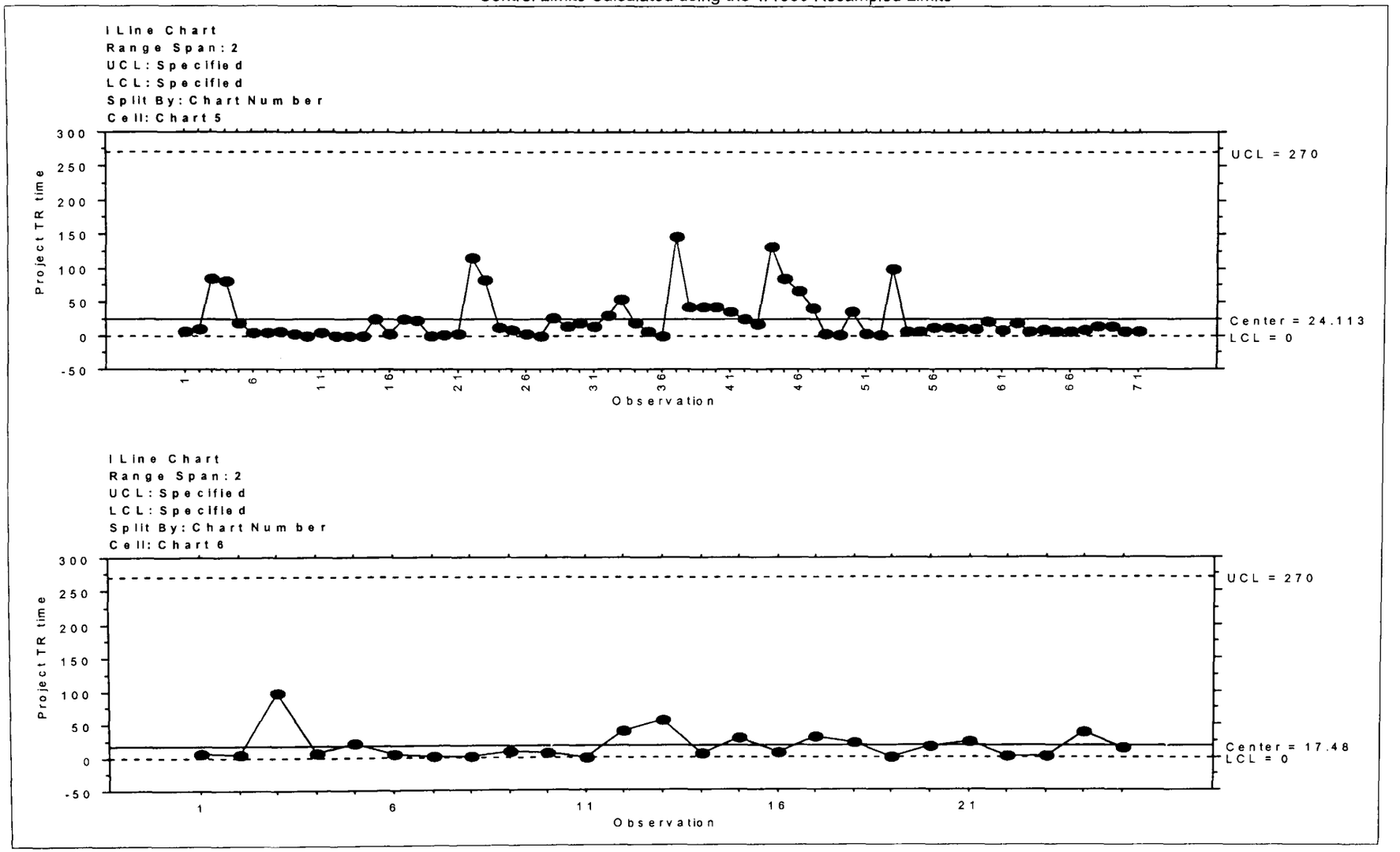


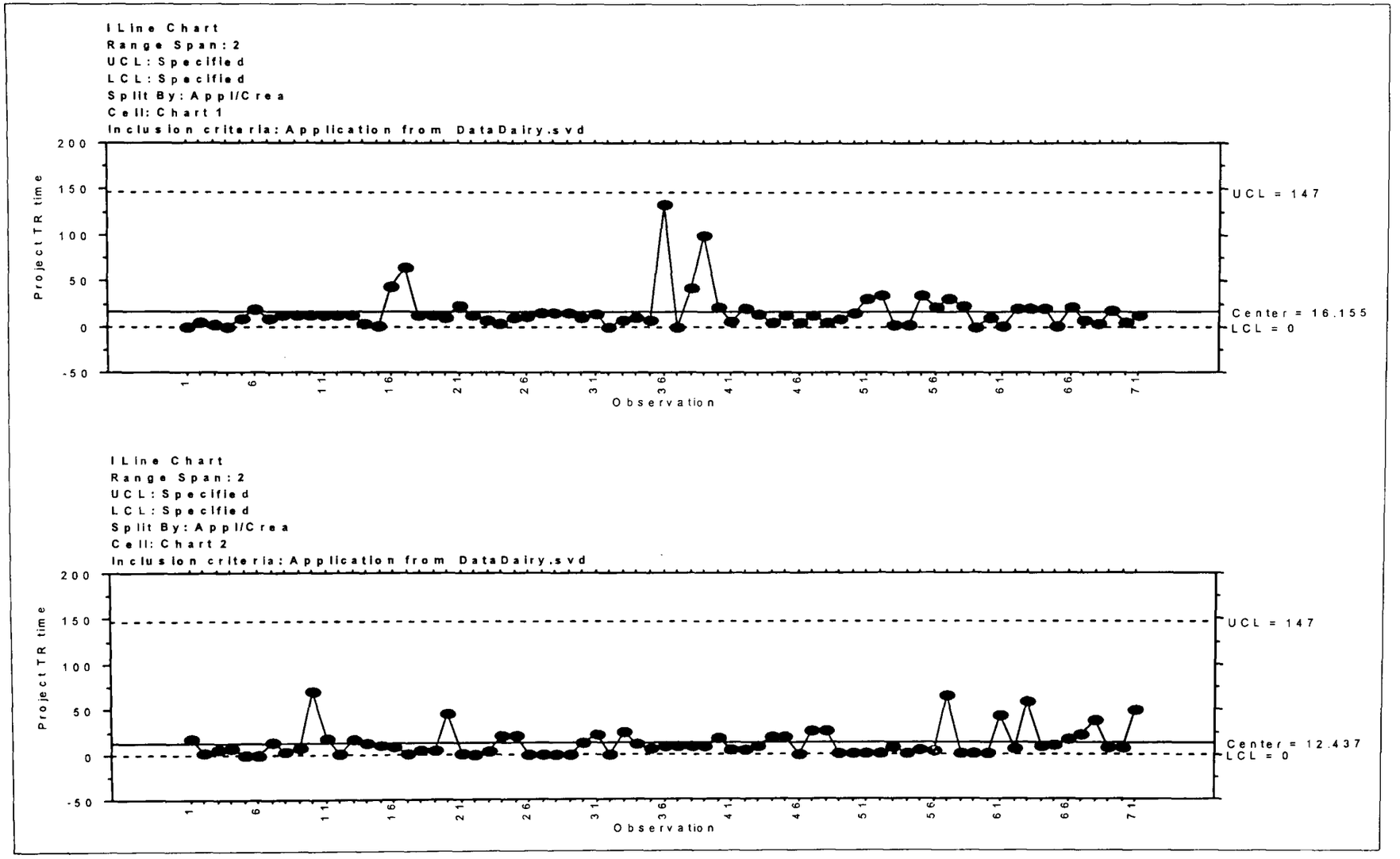
Dairy BU - All Projects

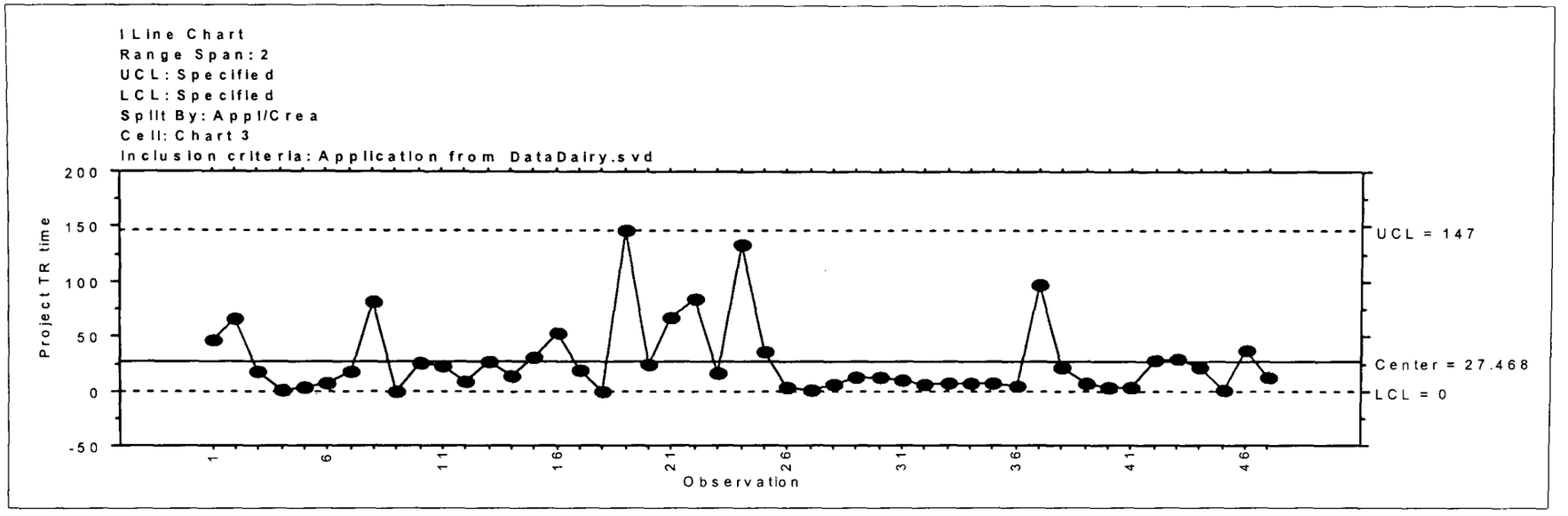
Control Limits Calculated using the 1/1000 Resampled Limits

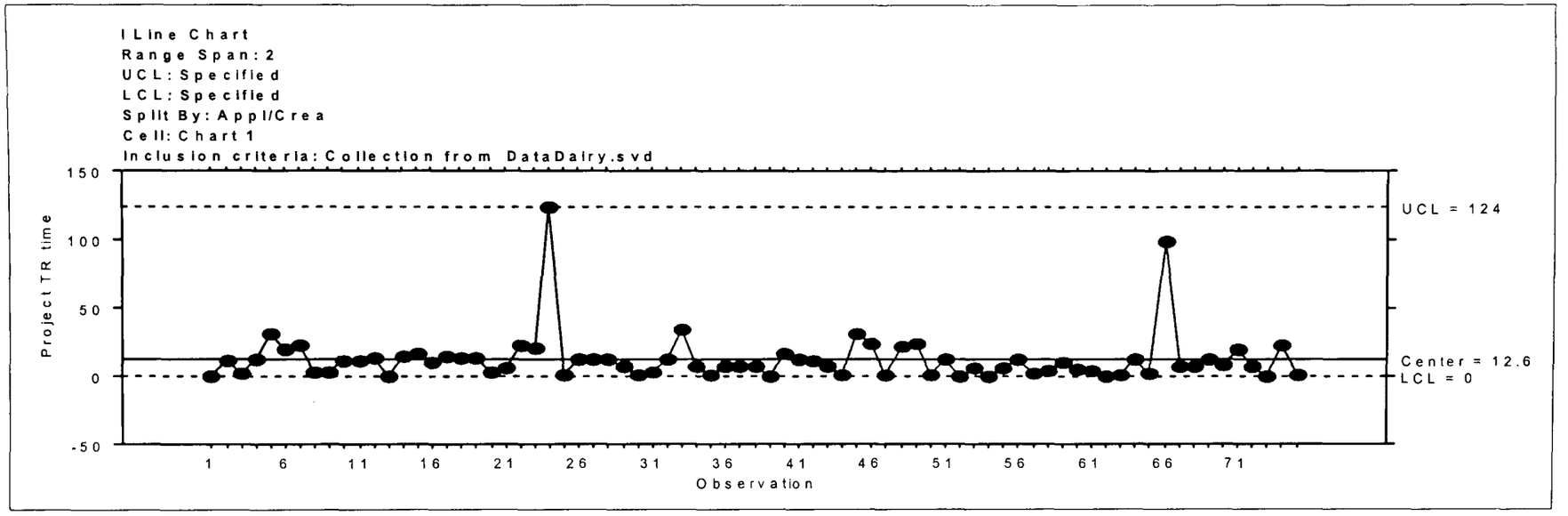


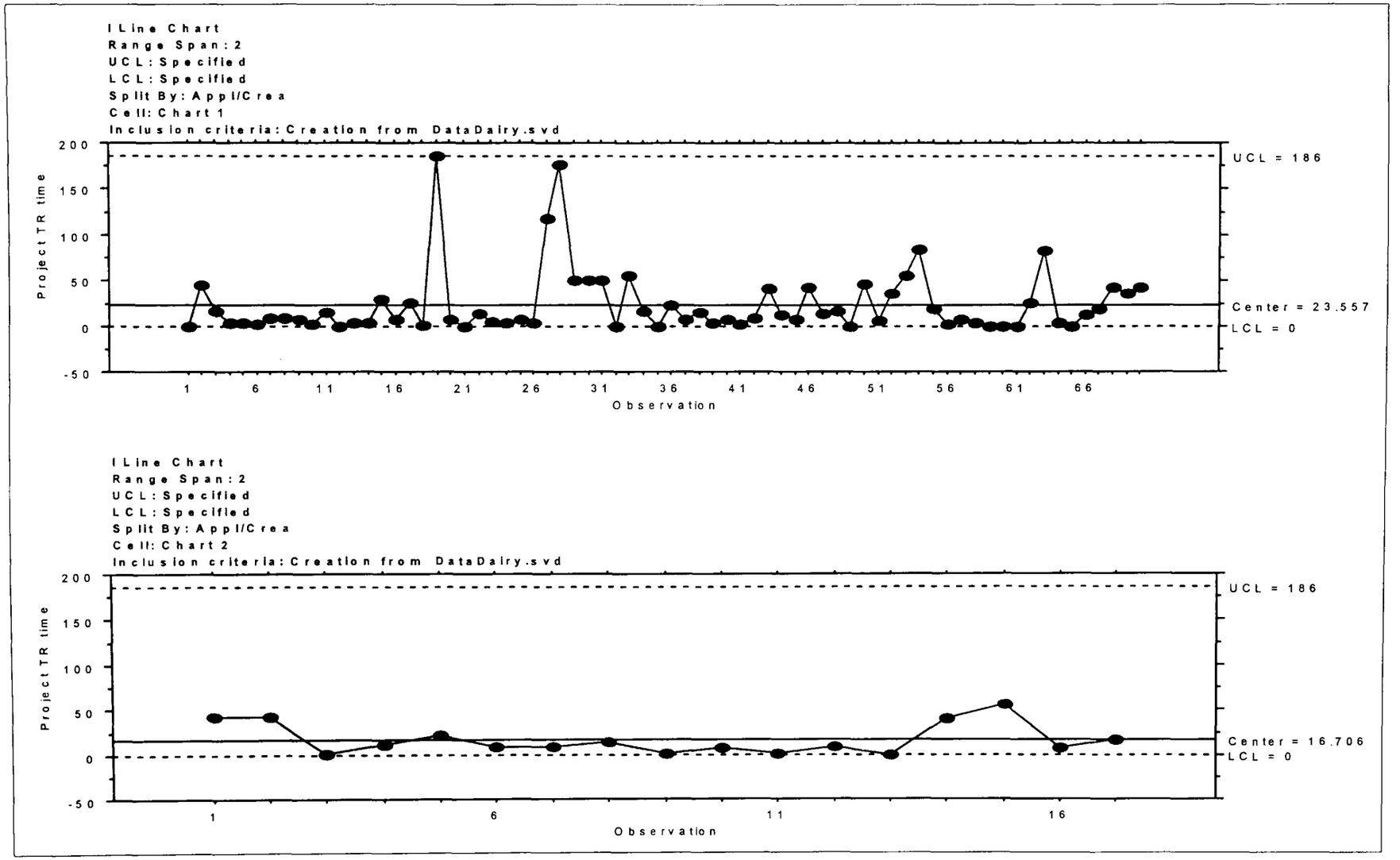
Dairy BU - All Projects
Control Limits Calculated using the 1/1000 Resampled Limits

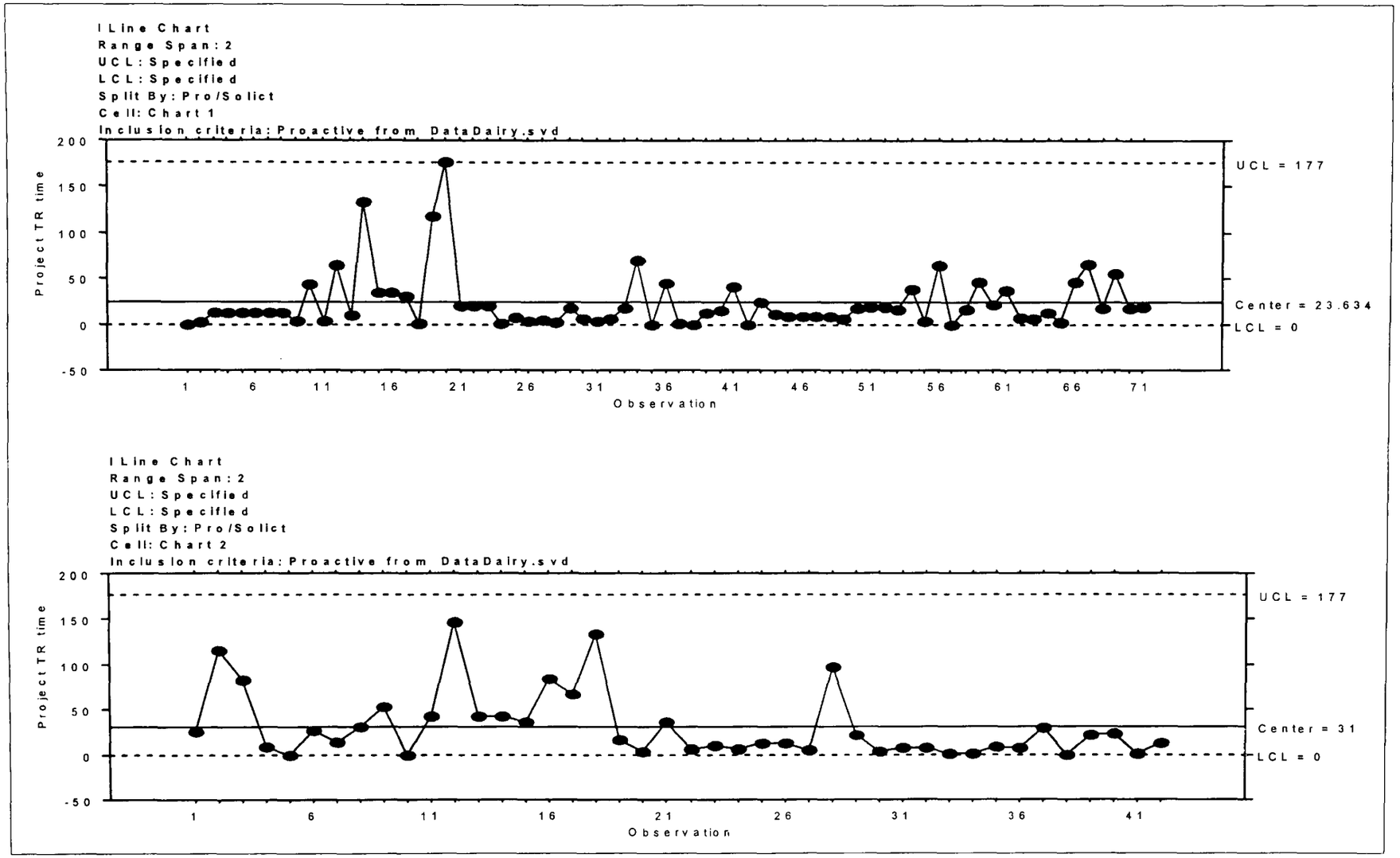


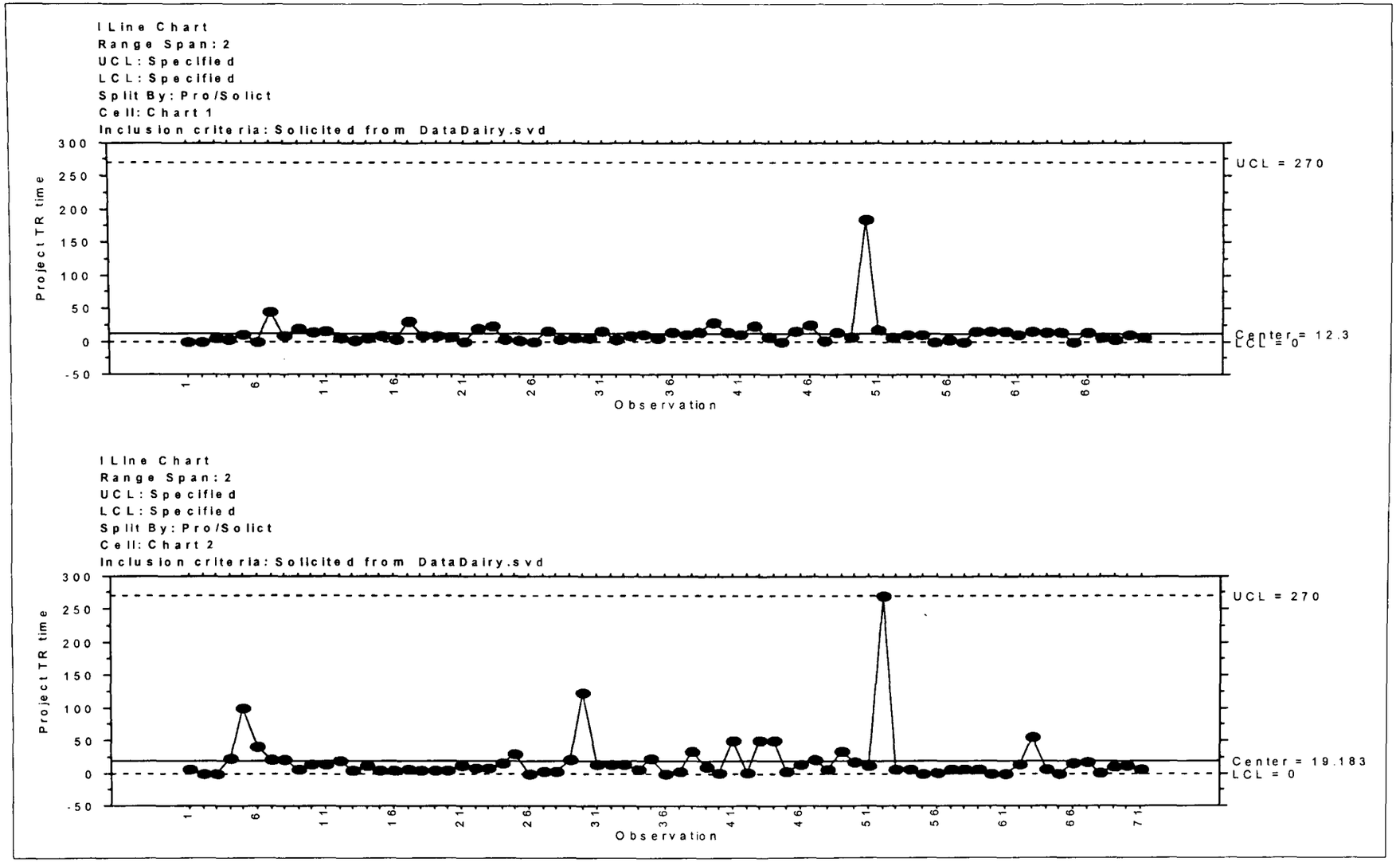

I Line Chart
Range Span: 2
UCL: Specified
LCL: Specified
Split By: Appl/Crea
Cell: Chart 1
Inclusion criteria: Application from DataDairy.svd
Project TR time
200
150
100
50
0
-50
UCL = 147
Center = 16.155
LCL = 0
1
6
11
16
21
26
31
36
41
46
51
56
61
66
71
Observation
I Line Chart
Range Span: 2
UCL: Specified
LCL: Specified
Split By: Appl/Crea
Cell: Chart 2
Inclusion criteria: Application from DataDairy.svd
Project TR time
200
150
100
50
0
-50
UCL = 147
Center = 12.437
LCL = 0
1
6
11
16
21
26
31
36
41
46
51
56
61
66
71
Observation

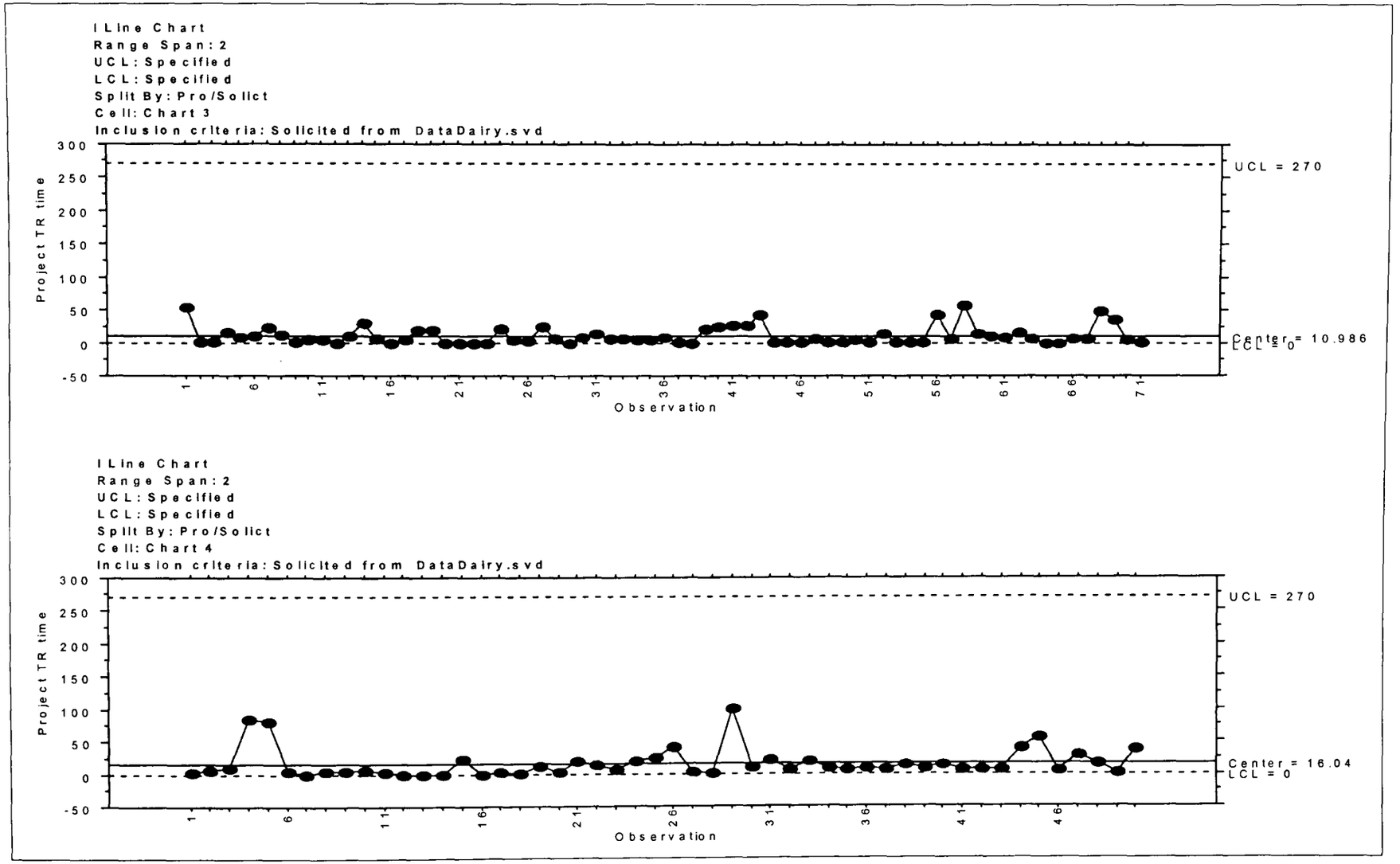

I Line Chart
Range Span: 2
UCL: Specified
LCL: Specified
Split By: Appl/Crea
Cell: Chart 3
Inclusion criteria: Application from DataDairy.svd
Project TR time
200
150
100
50
0
-50
1
6
11
16
21
26
31
36
41
46
Observation
UCL = 147
Center = 27.468
LCL = 0


I Line Chart
Range Span: 2
UCL: Specified
LCL: Specified
Split By: Appl/Crea
Cell: Chart 1
Inclusion criteria: Collection from DataDairy.svd
Project TR time
150
100
50
0
-50
UCL = 124
Center = 12.6
LCL = 0
1
6
11
16
21
26
31
36
41
46
51
56
61
66
71
Observation


I Line Chart
Range Span: 2
UCL: Specified
LCL: Specified
Split By: Appl/Crea
Cell: Chart 1
Inclusion criteria: Creation from DataDairy.svd
Project TR time
200
150
100
50
0
-50
UCL = 186
Center = 23.557
LCL = 0
1
6
11
16
21
26
31
36
41
46
51
56
61
66
Observation
I Line Chart
Range Span: 2
UCL: Specified
LCL: Specified
Split By: Appl/Crea
Cell: Chart 2
Inclusion criteria: Creation from DataDairy.svd
Project TR time
200
150
100
50
0
-50
UCL = 186
Center = 16.706
LCL = 0
1
6
11
16
Observation


I Line Chart
Range Span: 2
UCL: Specified
LCL: Specified
Split By: Pro/Solict
Cell: Chart 1
Inclusion criteria: Proactive from DataDairy.svd
Project TR time
200
150
100
50
0
-50
UCL = 177
Center = 23.634
LCL = 0
1
6
11
16
21
26
31
36
41
46
51
56
61
66
71
Observation
I Line Chart
Range Span: 2
UCL: Specified
LCL: Specified
Split By: Pro/Solict
Cell: Chart 2
Inclusion criteria: Proactive from DataDairy.svd
Project TR time
200
150
100
50
0
-50
UCL = 177
Center = 31
LCL = 0
1
6
11
16
21
26
31
36
41
Observation


I Line Chart
Range Span: 2
UCL: Specified
LCL: Specified
Split By: Pro/Solict
Cell: Chart 1
Inclusion criteria: Solicited from DataDairy.svd
Project TR time
300
250
200
150
100
50
0
-50
UCL = 270
Center = 12.3
LCL = 0
1
6
11
16
21
26
31
36
41
46
51
56
61
66
Observation
I Line Chart
Range Span: 2
UCL: Specified
LCL: Specified
Split By: Pro/Solict
Cell: Chart 2
Inclusion criteria: Solicited from DataDairy.svd
Project TR time
300
250
200
150
100
50
0
-50
UCL = 270
Center = 19.183
LCL = 0
1
6
11
16
21
26
31
36
41
46
51
56
61
66
71
Observation


I Line Chart
Range Span: 2
UCL: Specified
LCL: Specified
Split By: Pro/Solict
Cell: Chart 3
Inclusion criteria: Solicited from DataDairy.svd
Project TR time
300
250
200
150
100
50
0
-50
UCL = 270
Center = 10.986
LCL = 0
1
6
11
16
21
26
31
36
41
46
51
56
61
66
71
Observation
I Line Chart
Range Span: 2
UCL: Specified
LCL: Specified
Split By: Pro/Solict
Cell: Chart 4
Inclusion criteria: Solicited from DataDairy.svd
Project TR time
300
250
200
150
100
50
0
-50
UCL = 270
Center = 16.04
LCL = 0
1
6
11
16
21
26
31
36
41
46
Observation