YIELD

A Leading Provider of Smart, Connected and Secure Embedded Control Solutions

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SMART | CONNECTED | SECURE

Types

Types

- **Assembly Yield**
- **Control Yield**
- **Plan Yield**

Assembly Yield

- **Assembly Yield (AXT yield)**

  Assembly yield is an actual yield that captured from production operation in MES system. The yield is an *average* number by weekly with 13 weeks rolling data regardless of Assembly sites.

  Assembly Yield is supplied to SCP-Adexa planning module for lot starts quantities for assembly.

Control Yield

FT

Control Yield (FT)

Rules

- System will gather data from MES on a weekly basis.
- Data are in test step level
- Data average over the last 35 lots or 13 weeks. For new devices without data, it will default to 94%.
- Data will be filtered out maverick lots per 6IQR limit from the yield median (ignore the sample that lot yield < μ - 6IQR*)
- CTRL Yld = μ - 1.7σ *whereas μ = Avg Yld and σ = Standard Deviation*

- If the difference between current and previous calculation is <10%. There will be no change.

(*) Interquartile range : IQR = Q3-Q1

Plan Yield

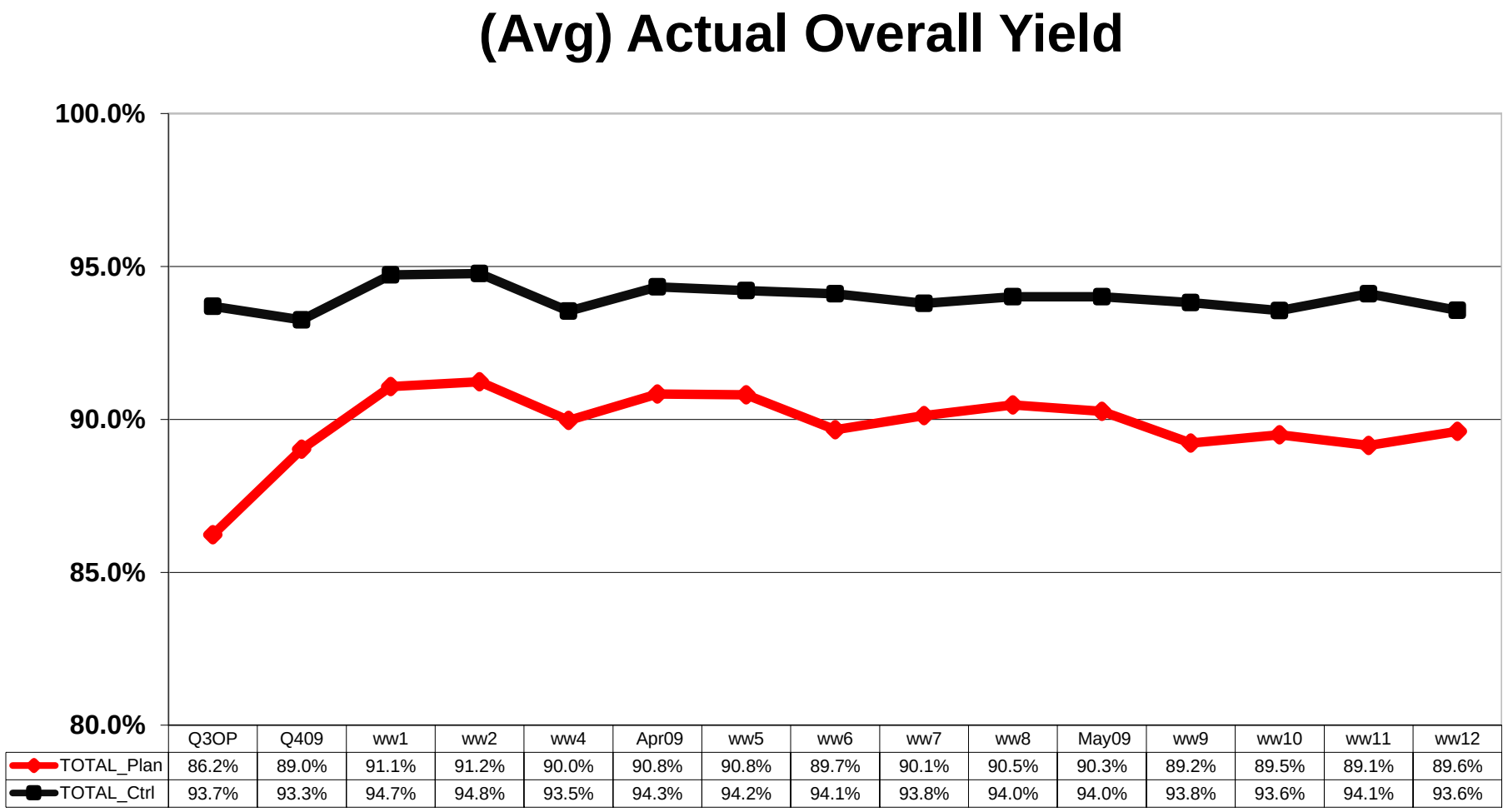
Plan Yield

Rules

- System will gather data from MES on a weekly basis.
- Data are in test step level
- Data average over the last 35 lots or 13 weeks. For new devices without data, it will default to 94%.
- Data will be filtered out maverick lots per 6IQR limit from the yield median (ignore the sample that lot yield < μ - 6IQR*)
- Plan Yld
  - $0 \leq \sigma < 2\%$: Plan Yld= $\mu - 4\sigma$
  - $2\% \leq \sigma < 3\%$: Plan Yld= $\mu - 3\sigma$
  - $\sigma \geq 3\%$: Plan Yld= $\mu - 2\sigma$

  whereas μ = Avg Yld and σ = Standard Deviation
- If the difference between current and previous calculation is <10%. There will be no change.

Plan Yield vs Control Yield

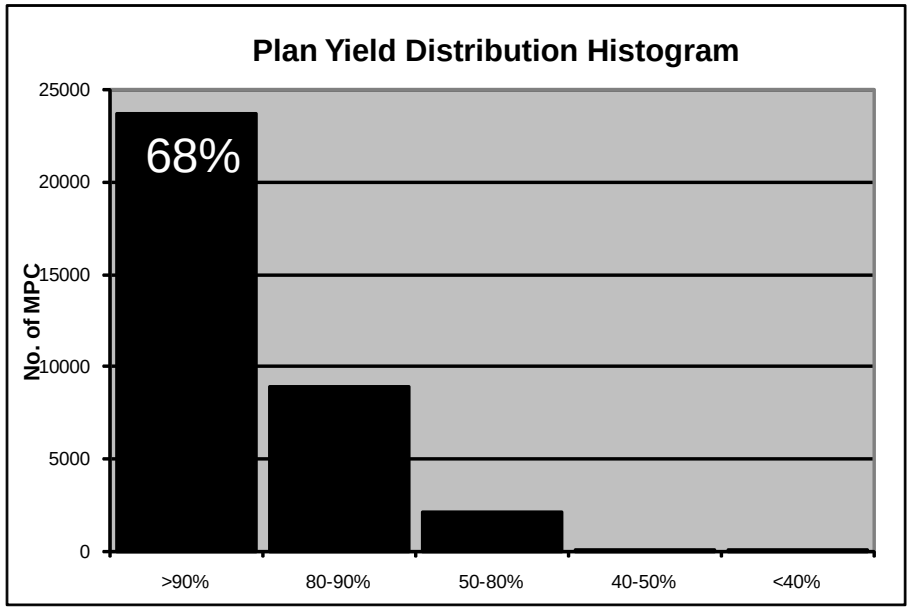


	Q3OP	Q409	ww1	ww2	ww4	Apr09	ww5	ww6	ww7	ww8	May09	ww9	ww10	ww11	ww12
TOTAL_Plan	86.2%	89.0%	91.1%	91.2%	90.0%	90.8%	90.8%	89.7%	90.1%	90.5%	90.3%	89.2%	89.5%	89.1%	89.6%
TOTAL_Ctrl	93.7%	93.3%	94.7%	94.8%	93.5%	94.3%	94.2%	94.1%	93.8%	94.0%	94.0%	93.8%	93.6%	94.1%	93.6%

Yield Distribution

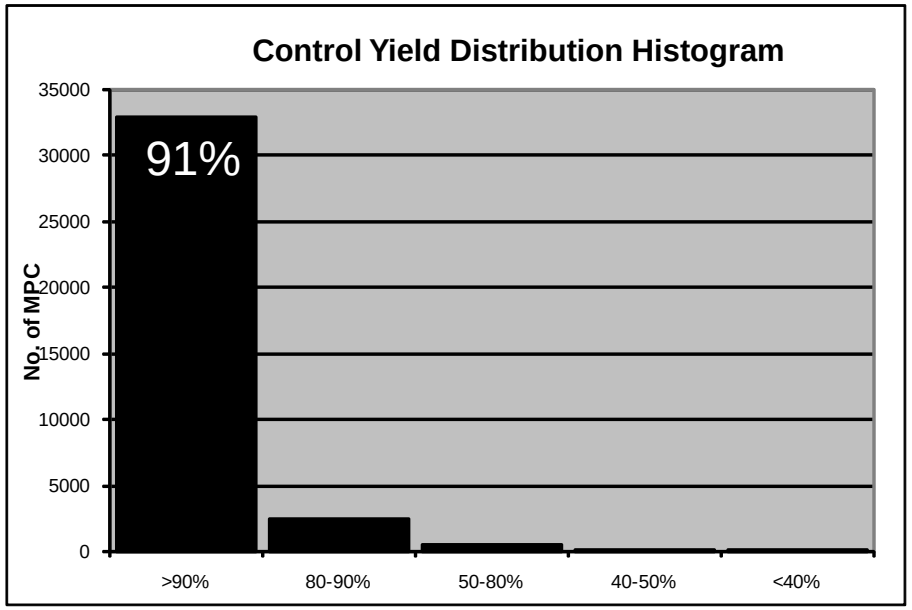
n	34749
MEAN	91.46
STD. DEV	7.3

Yield	#MPC	%
>90%	23706	68.2%
80-90%	8863	25.5%
50-80%	2063	5.9%
40-50%	54	0.2%
<40%	63	0.2%



n	36008
MEAN	96.286
STD. DEV	5.8

Yield	#MPC	%
>90%	32872	91.3%
80-90%	2419	6.7%
50-80%	520	1.4%
40-50%	73	0.2%
<40%	124	0.3%



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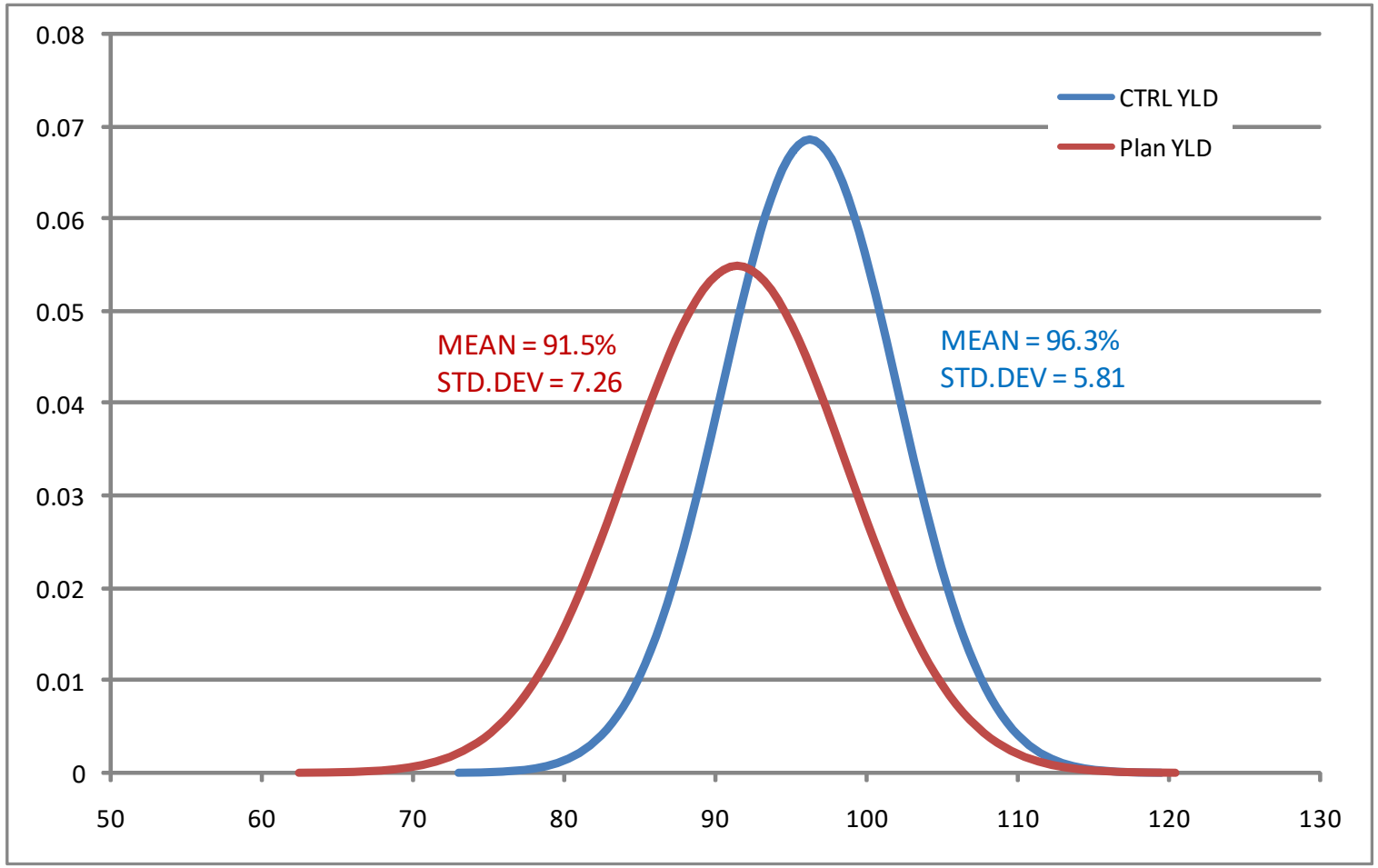
Yield Distribution



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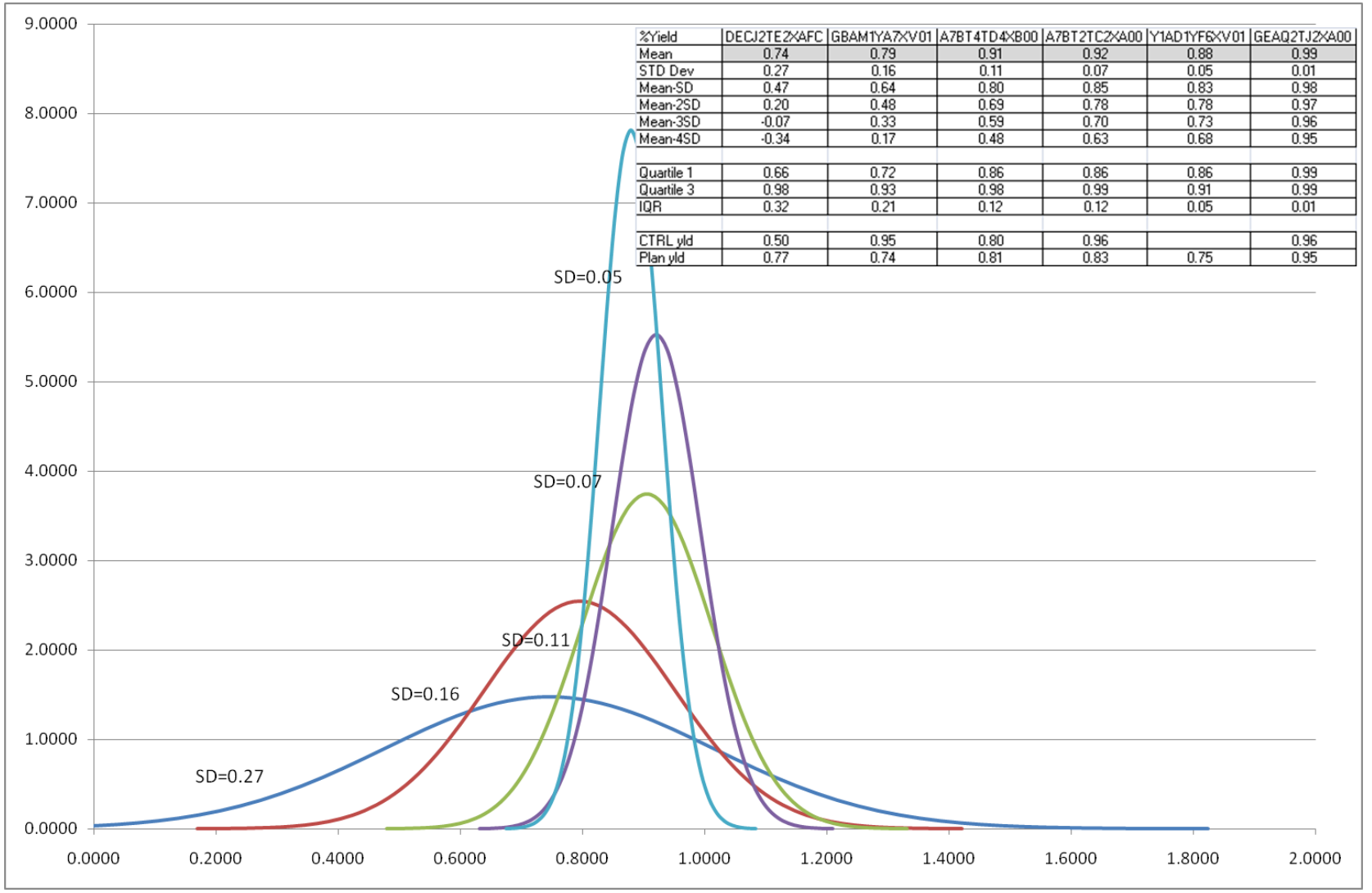
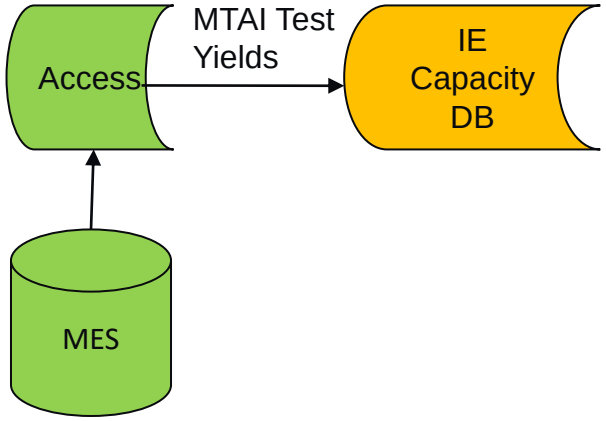
Sample Plan Yield (WW14)



%Yield	DECJ2TE2XAFC	GBAM1YA7XV01	A7BT4TD4XB00	A7BT2TC2XA00	Y1AD1YF6XV01	GEAQ2TJ2XA00
Mean	0.74	0.79	0.91	0.92	0.88	0.99
STD Dev	0.27	0.16	0.11	0.07	0.05	0.01
Mean-SD	0.47	0.64	0.80	0.85	0.83	0.98
Mean-2SD	0.20	0.48	0.69	0.78	0.78	0.97
Mean-3SD	-0.07	0.33	0.59	0.70	0.73	0.96
Mean-4SD	-0.34	0.17	0.48	0.63	0.68	0.95
Quartile 1	0.66	0.72	0.86	0.86	0.86	0.99
Quartile 3	0.98	0.93	0.98	0.99	0.91	0.99
IQR	0.32	0.21	0.12	0.12	0.05	0.01
CTRL yld	0.50	0.95	0.80	0.96		0.96
Plan yld	0.77	0.74	0.81	0.83	0.75	0.95

How Yield Works in CM



Plan Yield of each MPC will feed into CM as a cumulative yield. CM will split cum yield equally to all test steps (use n^{th} root of).

For example

DEEC2YR5X010, Flow:FQFQFQ ,
Cum yield = 95%

Yield for each step = 95% =98.3%

FT1 , cum yield = 98.3%
FT2 , cum yield = $(98.3\%)^2$ =96.6%
FT3 , cum yield = $(98.3\%)^3$ =95%

$$HPK_n = \frac{\text{(Test time + Index time)}}{\#Sites * Yld_n * Site\ Eff * Utln * 3.6}$$

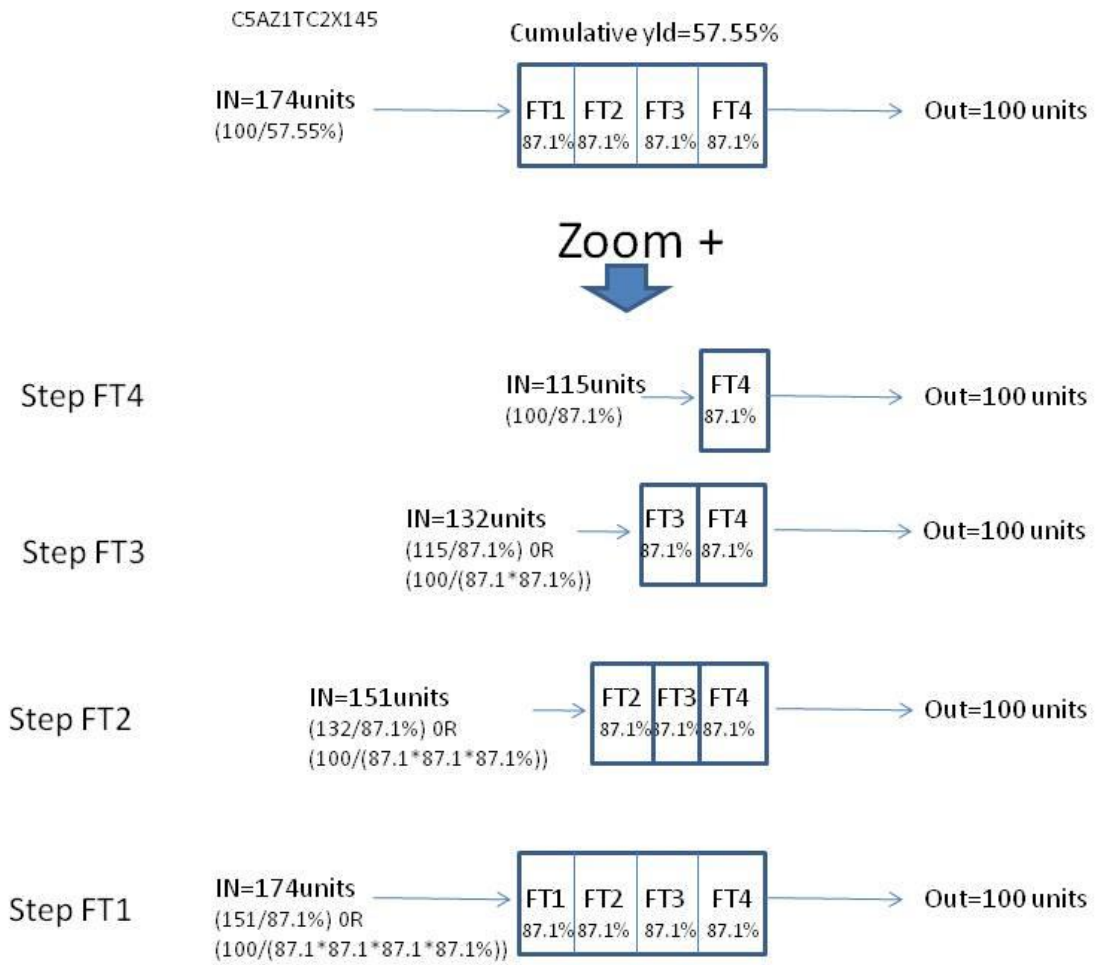
$KUPD_n$ is a reverse of HPK_n

Note : 100%yieldKUPD

$$HPK_n = \frac{\text{(Test time + Index time)}}{\#Sites * Site\ Eff * Utln * 3.6}$$

nth root of

Why using cumulative yield



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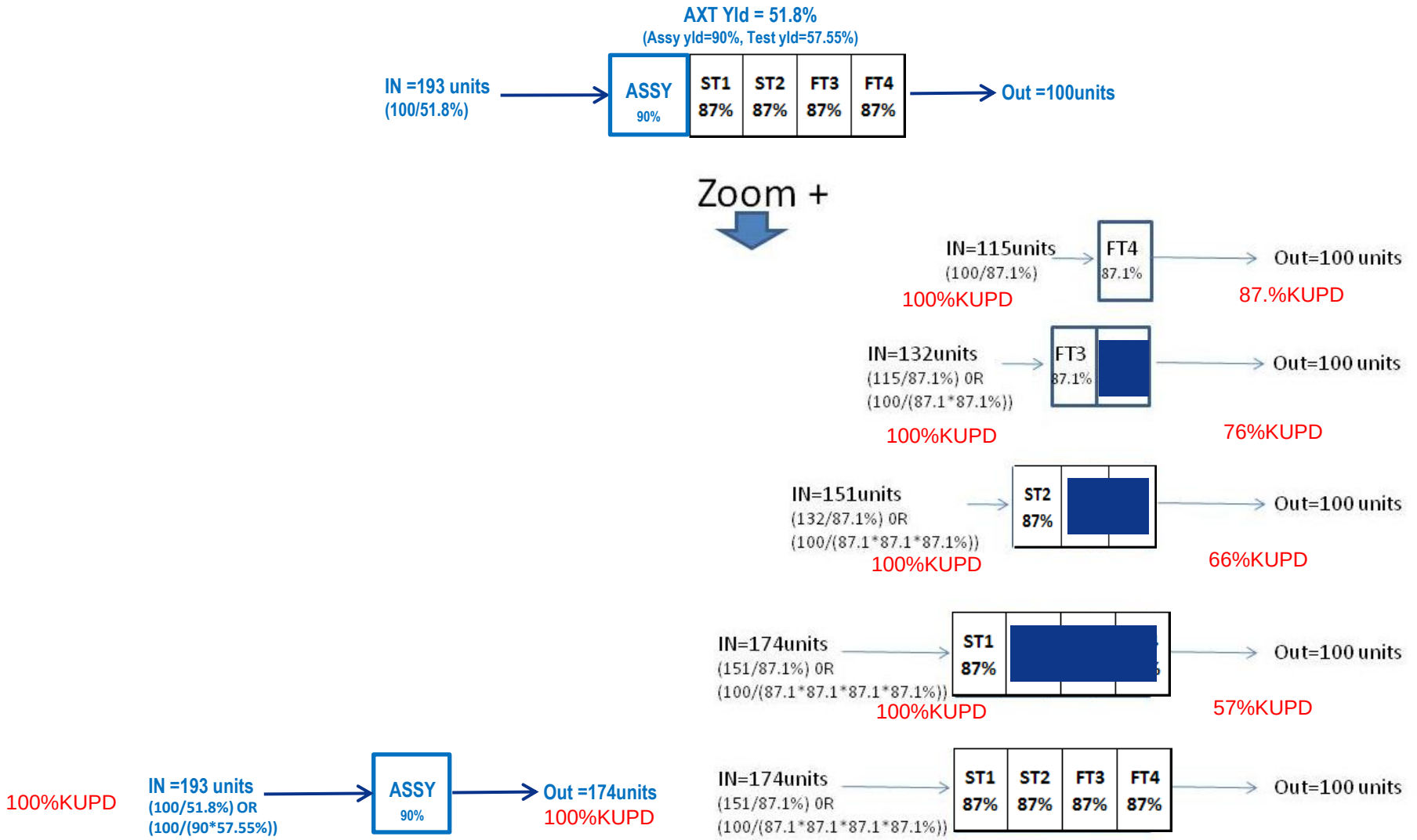
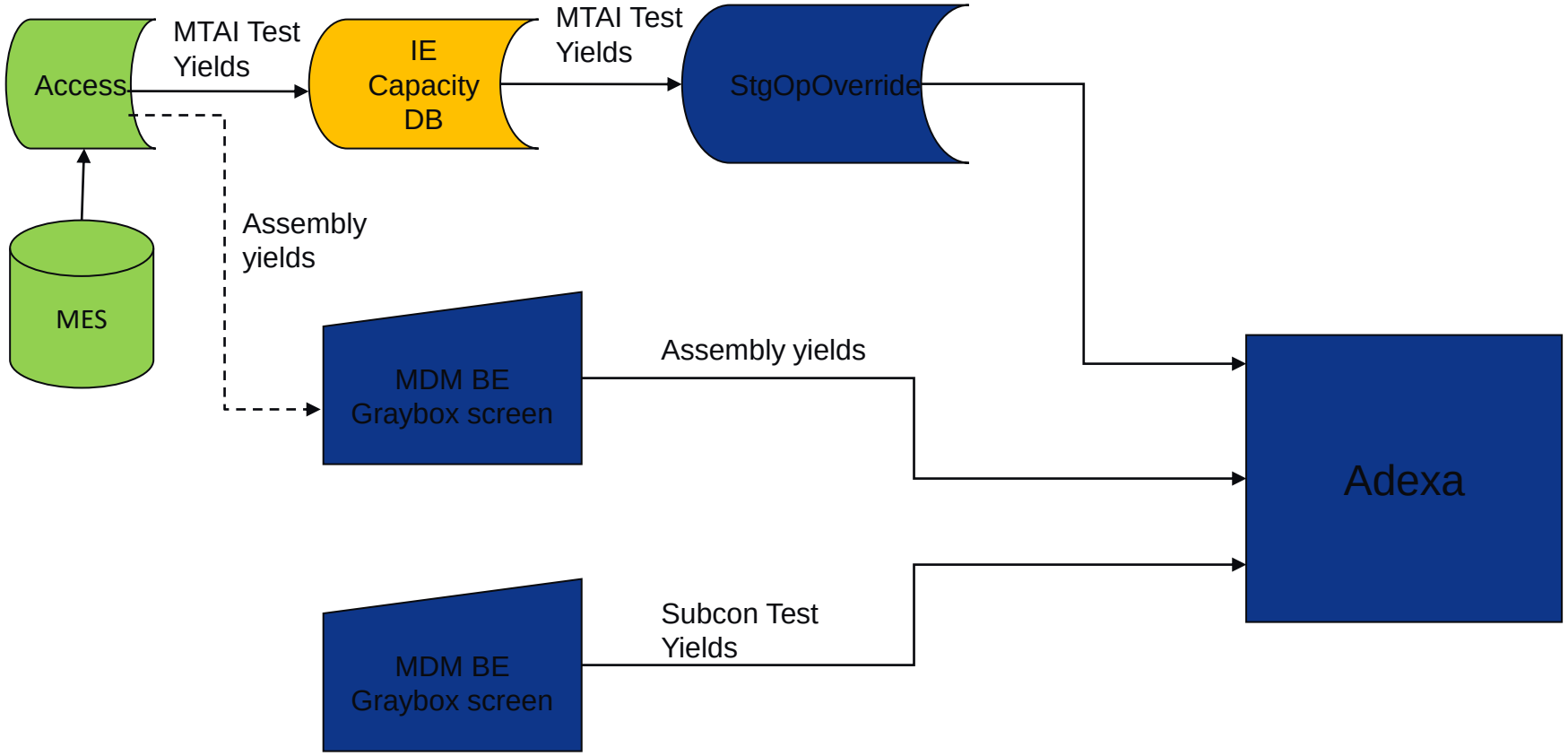
Yield feed to SCP



Flow of Yield to Adexa



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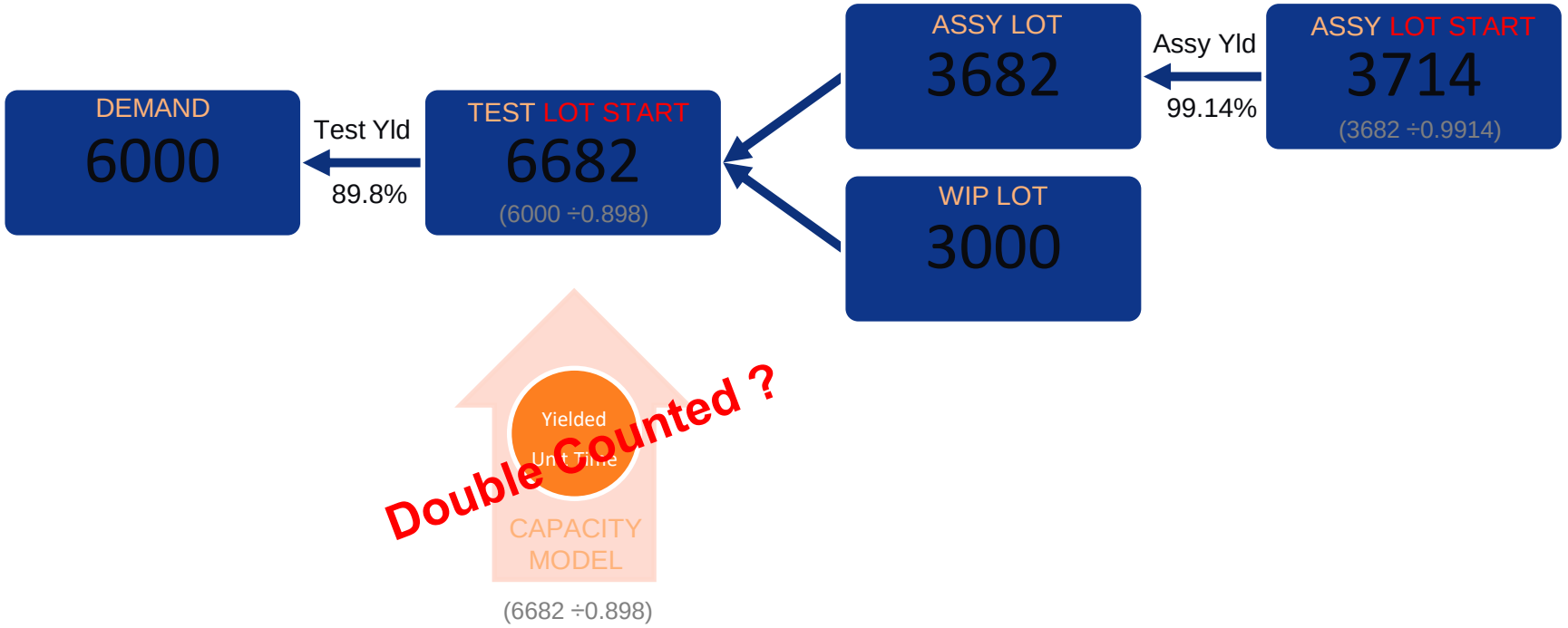
How Yield Works in SCP

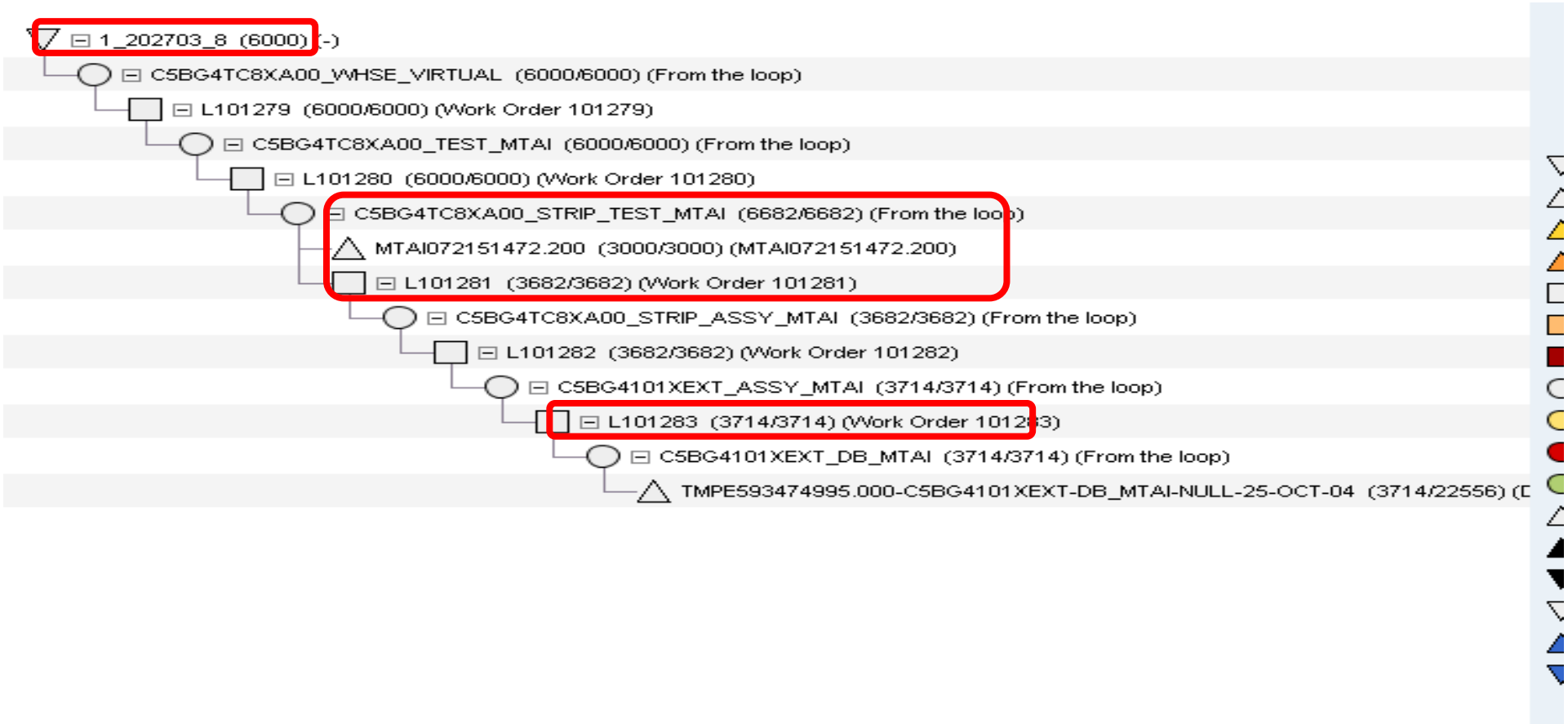
Yield will be factored into SCP when it figuring out the lot start quantities.

Example : *Demand 1_202703_8 of quantity 6000 for product C5BG4TC8XA00*

(Assy Yield = 99.14%, Test Yield = 89.8%)



Hierarchy



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Thank you