

VM600^{Mk2} Commercial Update



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To Fly To Power To Live

Agenda

- VM600^{Mk2} Program Update
- Success Stories So Far...
- VM600^{Mk2} CMS Update
- VM600^{Mk2} Pricing Strategy
- VM600^{Mk1} Phase Out Plan
- Marketing Updates (Tools, Website etc.)
- Feedback , Comments, Q&A

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VM600^{Mk2} Program Update

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Success Stories So Far...

- Hydro Project in Switzerland For 4 Turbines With Rittmeyer
 - Customer Blue Chips:
 - Proximity & Local Content (in Country)
 - Flexible & Upgradable System
 - Required Brand & Innovation
 - Competitive In Price & Features
 - Turnkey Supplier: Sensors, Systems, P&I
- 30MW Dresser Steam Turbine SNVE France
 - Customer Blue Chips:
 - Long Association With Vibrometer/Meggitt
 - Upgrade Of Bentley 3000 Series MPS
 - Reliability, Modern, State Of The Art MPS Solution
 - Integration With DCS System, Compatibility With Vision Capabilities
- 6x Supercritical Turbine's In India (4640MW)
 - Customer Blue Chips:
 - Proven Track Record On Supercritical
 - High End Specification...Looked For VM
 - Win... 13 Years HW & SW Support
 - Competitive In Price & Features
 - All Inclusive... Turnkey Solution
- In Norway To Retrofit 2 Francis Turbines
 - Customer Blue Chips:
 - No Risk Of Obsolescence
 - Upgradable System
 - Enhance & Big Data Digitalization In Near Future
 - Delivery And Install In August-2021

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VM600^{Mk2} CMS Update

- High Level CMS Specs & Features
 - Integrated CMS With Full Visibility Of MPS Outputs & Alarms
 - Complete Segregation From MPS
 - New Easy To Use Condition Monitoring Configuration Software
 - Configuration And Modelling Of Machine Trains Layout (Mimic)
 - CMS Available On Both Standard & SIL Versions Of MPC4^{Mk2}
 - 1GB Onboard Memory On Both Standard & SIL Versions Of MPC4^{Mk2}
 - Separate Memory On SIL Version MPC4^{Mk2} [i.e. More Processing Power]
 - Up To 9 Extraction Per Processing Channel
 - 100 mSec Update Rate
 - Up 4400 Lines FFT @ 100 mSec
 - Alarms/Severity Levels Configurable Per Measurements
 - Fixed Frequency & Order Tracking
 - Dual Channel Processing...Full Spectrum, Orbit, Shaft Absolute Vibration etc.
 - Several Windowing Options For Spectrum
 - Rectangular, Hanning, Hamming, Flattop, Blackman, Blackman Harris, Tukey

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VM600^{Mk2} Pricing Strategy

VM600^{Mk2} Project Goals

Phase 1 (MPS Only)

- Secure existing business
- Improve margins by at least the COGS down on the cards (where there is no clearly identified additional value to the customer of using the new cards)

Phases 2&3

- Gain in **competitiveness for large installations** with low-to-medium technical requirements on CMS (typical BOP scope and semi-critical machines) by removing the need for extra hardware.
- Significantly increase margins** on these projects.
- Add and extract value** on all other new/extra features.

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VM600^{Mk1} Phase Out Plan

Why Phase Out VM600^{Mk1} ?

- Components Obsolescence**
 - Limited Capacity To Produce VM600^{Mk1} System Components
 - Can Produce 25-100 VM600^{Mk1} SYS With Current Stock
 - CPUM, MPC4 & AMCB Most Severely Impacted
 - Other Cards Expected To Follow
- Contractual/Spares Support Commitments To Customers For 5-10 Years**
- Actions Proposed/Taken**
 - VM600^{Mk1} - Stop Offering! & Push To Convert All Open Quotes To Mk2
 - Action Team & Steering Committee For Driving Key Actions
 - Communications...Internal & External...Coming Shortly...
 - Promote Mk2 For All New Orders/Opportunities
 - Upgrade CPUM-CPR2 & MPC4^{Mk1} to MPC4^{Mk2}
 - Accelerate Mk2 Production, Deliveries & Development Activities etc..

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MARKETING SUPPORT - TIMELINE

	November	December	January	February	March
Webinar	VM600 ^{Mk2} Success Stories & application notes		VM600 ^{Mk2} Vibrosight Capture live demo		VM600 ^{Mk2} Competitive Intelligence (Post on Dtd)
Report content	Report article #1	T1 practical guide Report article #2	White Paper	Report article #3	Report article #4
Marketing		Trade show #1		New brochure knowledge is power	

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Feedback, Comments & Questions ?

Go to www.menti.com and use code 6546 3575

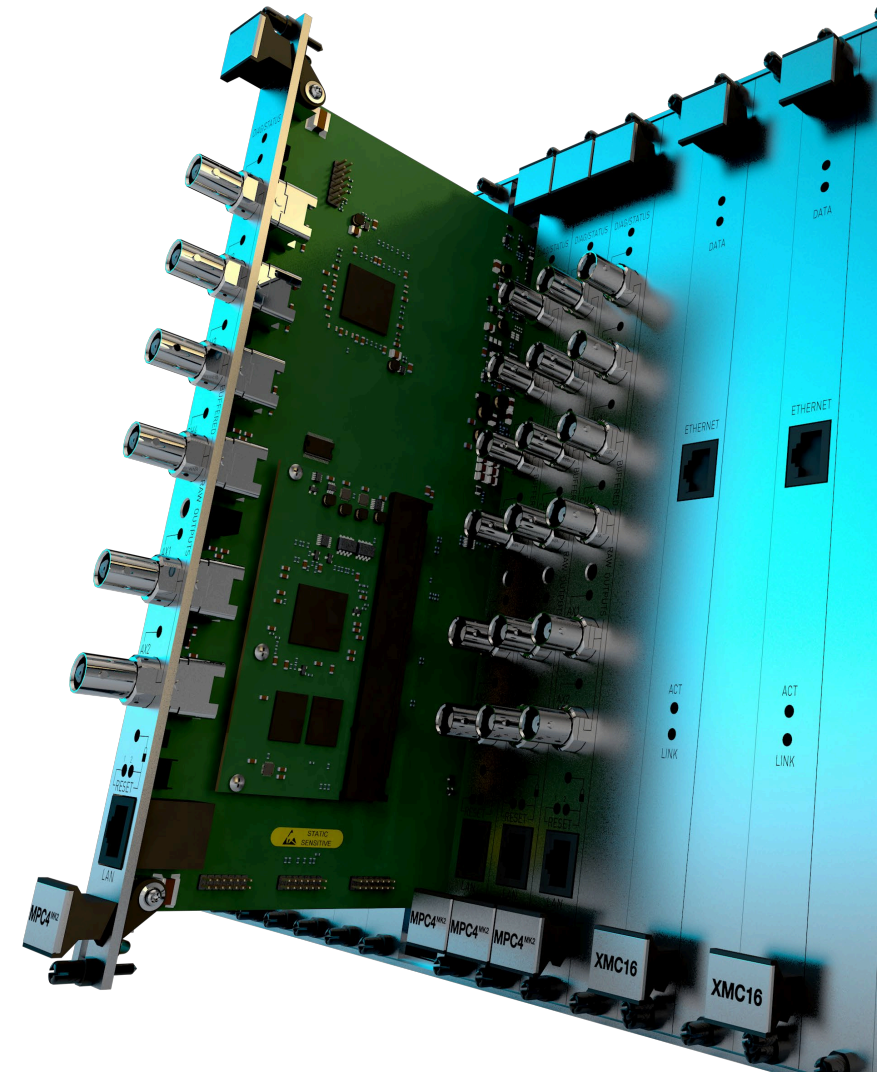
Thank You....

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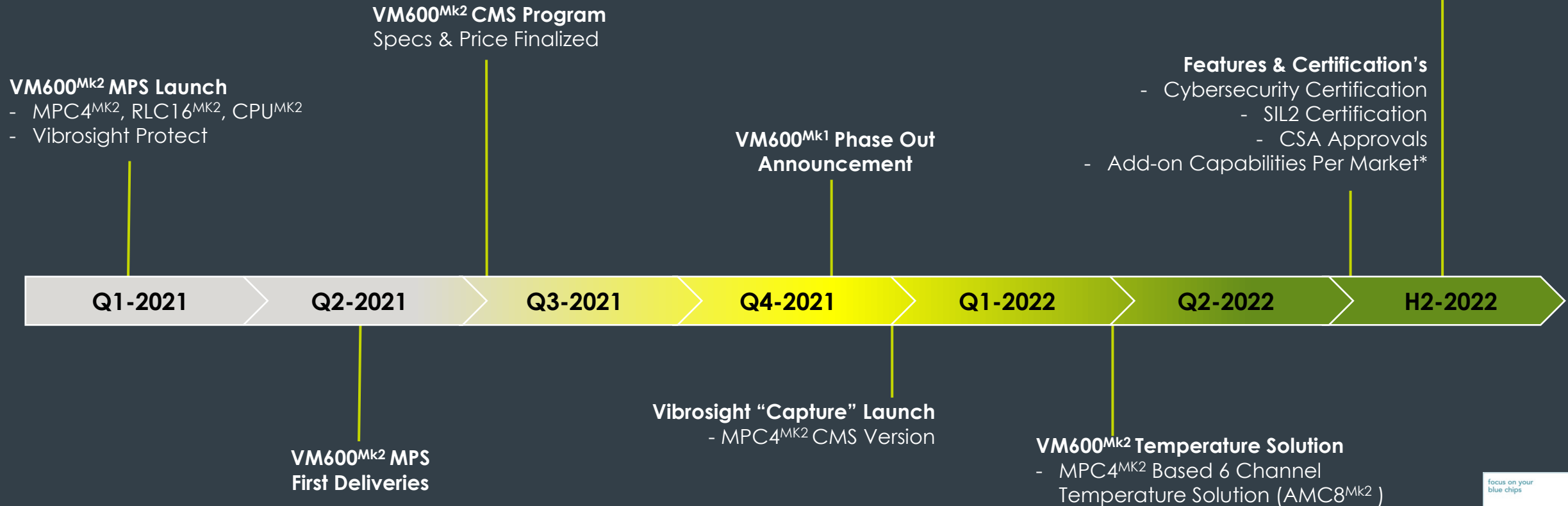
Agenda

- ❑ VM600^{Mk2} Program Update
- ❑ Success Stories So Far...
- ❑ VM600^{Mk2} CMS Update
- ❑ VM600^{Mk2} Pricing Strategy
- ❑ VM600^{Mk1} Phase Out Plan
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- ❑ Feedback , Comments, Q&A



VM600^{Mk2} Program Update

VM600^{Mk1} Platform Obsolete



Success Stories So Far...

✓ Hydro Project In Switzerland For 4 Turbines With Rittmeyer

▪ Customer Blue Chips:

- Proximity & Local Content (In Country)
- Flexible & Upgradable System
- Reputed Brand & Innovation
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- Turnkey Supplier: Sensors, Systems, PEM



✓ 30MW Dresser Steam Turbine SNVE France

▪ Customer Blue Chips:

- Long Association With Vibrometer/Meggitt
- Upgrade Of Bently 3300 Series MPS
- Reliability, Modern, State Of The Art MPS Solution
- Integration With DCS System, Compatibility With Vision
- Competitive Price



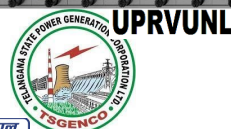
✓ 6x Supercritical Turbine's In India (4660MW)

▪ Customer Blue Chips:

- Proven Track Record On Supercritical
- High End Specification...(Lockin For VM)
- Min... 15 Years HW & SW Support
- Competitive In Price & Features
- All Inclusive... Turnkey Solution



YTD VM600^{Mk2} Project Wins ~2000K



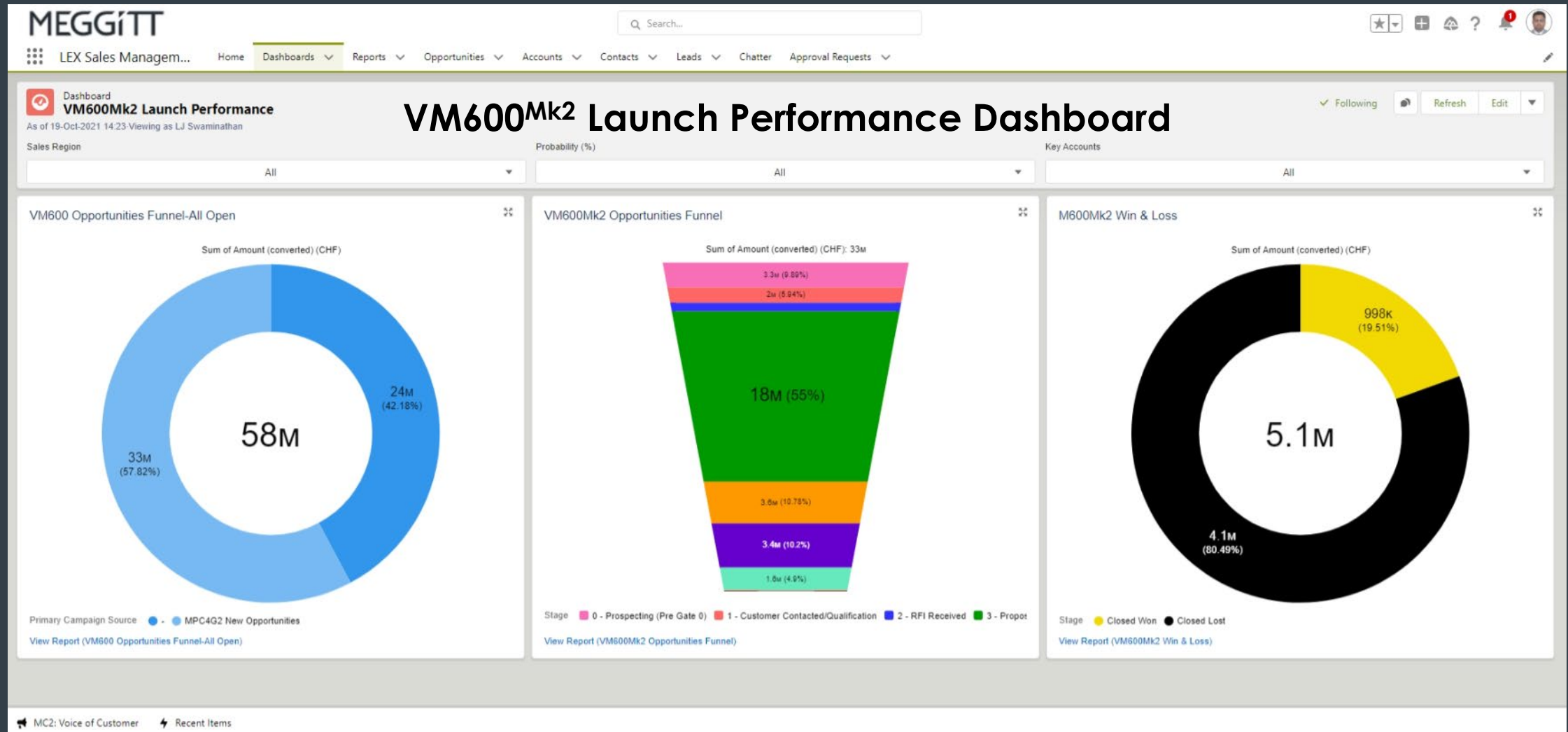
In Norway To Retrofit 2 Francis Turbines

▪ Customer Blue Chips:

- Proven Track Record, No Risk Of Obsolescence
- Upgradable System
- Optimize OMS & Big Data Digitalization In Near Future
- Delivery And Install In August-2021



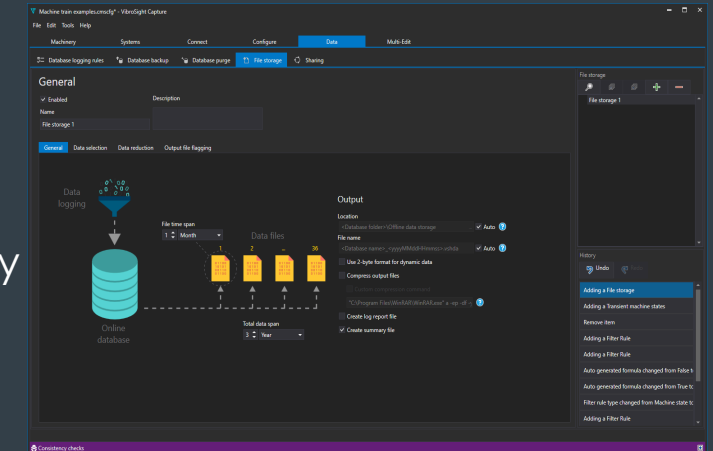
Success Stories So Far...



VM600^{Mk2} CMS Update

✓ High Level CMS Specs & Features

- ✓ Integrated CMS With Full Visibility Of MPS Outputs & Alarms
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VM600^{Mk2} Pricing Strategy

VM600^{Mk2} Project Goals

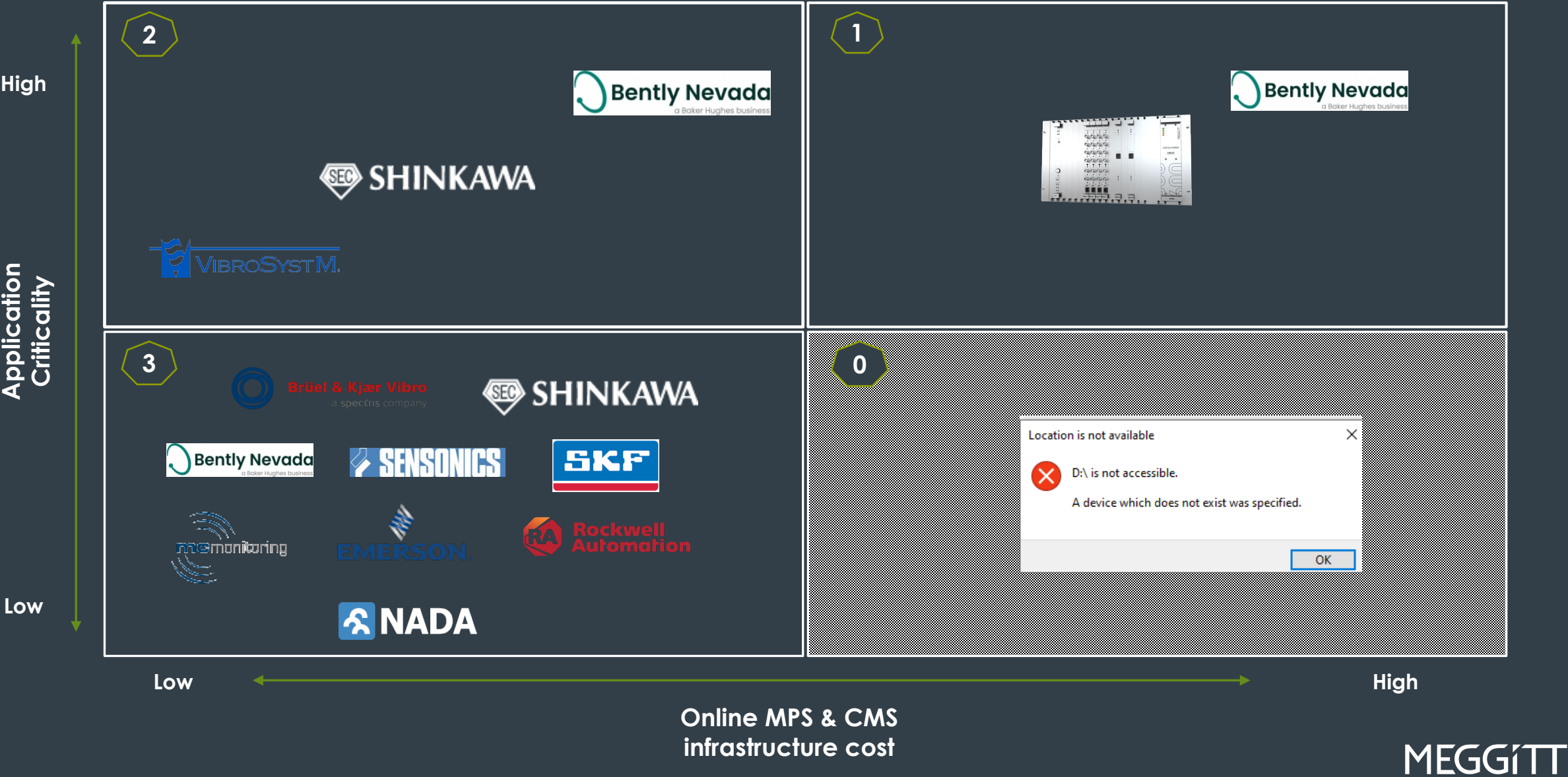
Phase 1 (MPS Only)

- ❑ Secure existing business
- ❑ Improve margins by at least the COGS down on the cards (where there is no clearly identified additional value to the customer of using the new cards)

Phases 2&3

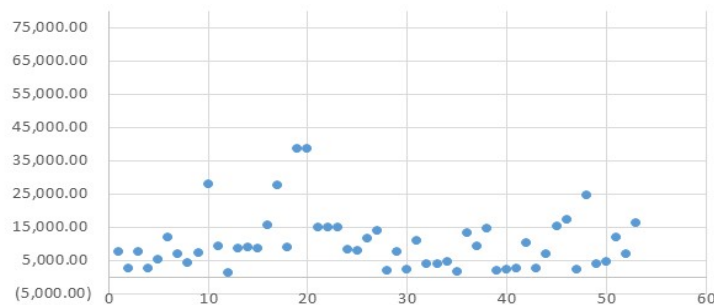
- ❑ Gain in **competitiveness for large installations** with low-to-medium technical requirements on CMS (typical BOP scope and semi-critical machines) by removing the need for extra hardware.
- ❑ **Significantly increase margins** on these projects.
- ❑ **Add and extract value** on all other new/extra features.

Competitive Landscape

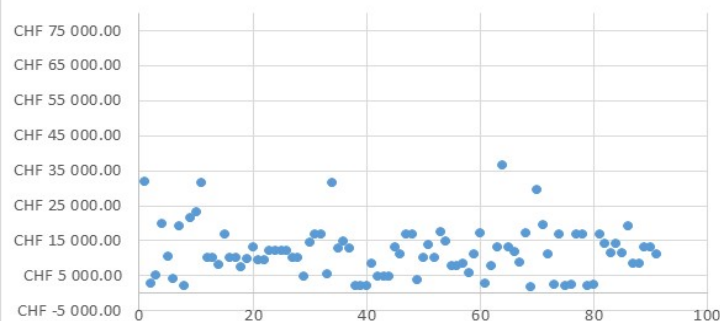


VM600^{Mk2} Pricing Strategy

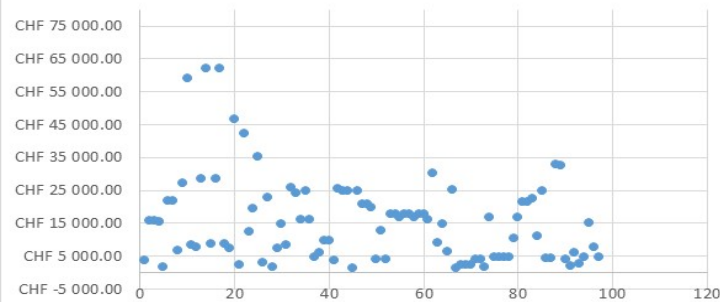
2020 VibroSight Server License Price



2019 VibroSight Server License Price



2018 VibroSight Server License Price



What Price Are We Winning At?

- ❑ ~ 125 Vibrosight Licenses Sold/Year @CHF8K Per License @ 60% Disc.
- ❑ ~150 XMx's Sold/Year @ >50% Disc.

Conclusion's

- ❑ **Current Price For “MPS+CMS” Solutions Not Aligned To Market**
 - ❑ ~30% Lower v/s Current XMV Based Solution for “Medium To Large” Installations
 - ❑ Severely Affects GM If HW+SW Discounted @ >50% With XMV Based Solution
- ❑ **Opportunity To Simplify Vibrosight Ordering Codes & Options**
 - ❑ Abnormal Disc On Software...& Huge Variations (Customer Loses Trust)
 - ❑ SW Sustaining Cost Of ~500K/Year i.e., 4K Per License...
 - ❑ Low Sales Of Site Licenses, Support Plan & Addon Packages

Pricing Summary For VM600^{Mk2} & CMS

3 Variants Of Standard MPC4^{Mk2}

- ✓ Standard MPS Version @CHF3533 (No Change From Mk1)
- ✓ CMS Version @ CHF4813 (~ 50% Lower Compared To XMV Based Solution)
- ✓ Onsite CMS Upgrade Opportunities @ +1920 Per Module
- ❖ SIL & SIL+CMS Version Pricing TBA Later...

❑ Simplified Software Ordering & Pricing

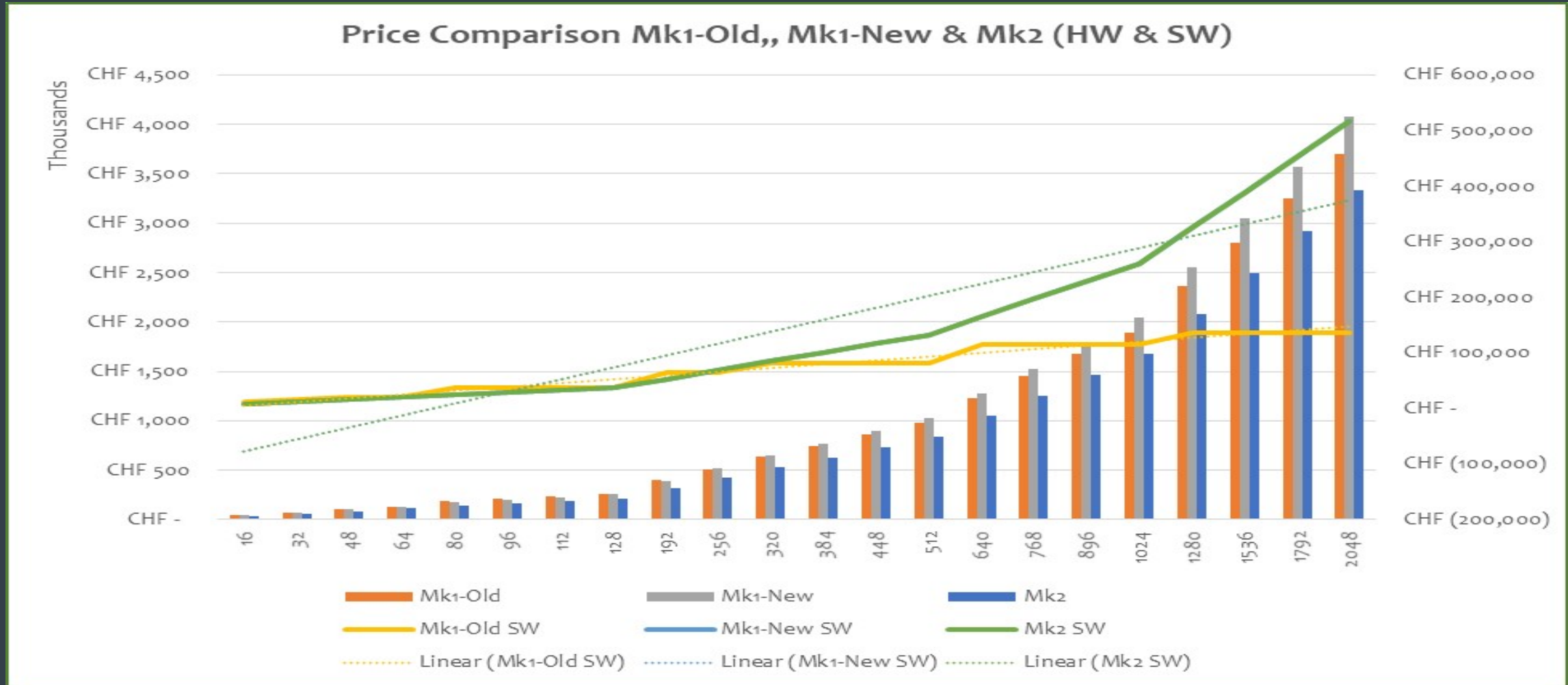
- ✓ Lean, Simplified Ordering Option Code's...Down To 4 From >12 Earlier
- ✓ 3 Software Editions
 - Lite: Current Trend Version, MPS2 Equiv.++
 - Classic: Standard Vibrosight CMS Capabilities (Including Hydro)
 - Premium: Classic Plus All Other Optional/Addon Capabilities Included (See List)
- ✓ SW Pricing Independent From HW Platform, Pay/Use Channels...
- ✓ Unlimited OPC/Modbus In Software Editions...i.e. No Need Order This Separately
- ✓ Simplified Software Support Plan Ordering & Renewals
 - Max. 3 Years In Initial Order, Fixed Price Per Year Based On SW Edition Selected
 - Simplified & Separate Code For Renewals/Extensions
- ✓ Others: Separate Code For Demo Version, Rule Box Price Increased to CHF15K

VM600^{Mk2} Pricing Strategy

Vibrosight Pricing & Ordering New Order						
Code	Descriptor	Options	List Price	Selection	Price	Explanation/Designation
699-004-000-555	Vibrosight Software Package		CHF -	CHF -	CHF -	Vibrosight Software Package
A	Software Edition & Order Type	01	CHF 3,485	01	CHF 3,485	Vibrosight Lite: Configuration & HMI Software for VM600™ & VibroSmart Includes: -Trends, Bar Graphs & Minis; Suitable for Unlimited VM600™, VibroSmart & XMY Channels -Up to 128 OPC/Modbus Server/Client Tags Vibrosight Classic: Basic Condition Monitoring Server And Client Suite: -Suitable For Standalone Or Multi Server Installations -1 Network Client (For Network & Offline Client Users) Vibrosight Premium: Advanced Condition Monitoring Server And Client Suite: -Suitable For Standalone Or Multi Server Installations -3 Network Client (For Network & Offline Client Users) -Premium Addon Application's Package - Database Mirroring - Custom Mathematical Calculation Engine - Combustion Monitoring Vibrosight Condition Monitoring Client Suite (For Network & Offline Client Users) Vibrosight Protect, Configuration Software Package for VM600™ & VibroSmart
		02	CHF 4,985			
		03	CHF 79,985			
		04	CHF 1,097			
		05	CHF 485			
B	Vibrosight CMS Channel Licenses: Enter No. of Channels To Be Used e.g. -00 For None, -128 For 128 Channels etc.	00	CHF -	00	CHF -	No Additional License (Applicable For Axx, Axx & Axx) Pricing Based On Qty Of Channel Selected: -CMS Channel Licenses For 16 Channels Included in Vibrosight Lite Edition (Axx) All Other Features & Capabilities Depend On Software Edition Selected
		64	CHF 344			
C	Additional Client Suite (For Network & Offline Client Users)	0	CHF 1,097	0	CHF -	Enter Qty Of Additional Client Access Licenses @ CHF100 Per License e.g. 0000 For None, 0001 For 1, 0007 For 7 etc.
D	Software Maintenance & Support Plan (Price is 1 OF Total Price Per Ordering Options) 1 OF A+B+C Price	00	CHF -	00	CHF -	No Additional Support -1 Year, 25% Of Package List Price & Payable Uplift -1 Year, 25% Of Package List Price & Payable Uplift -1 Year, 25% Of Package List Price & Payable Uplift
		01	CHF 755			
		02	CHF 250			
		03	CHF 395			
Final Ordering Code Based On Selected Options				699-004-000-555-Axx-Bxx-Cxx-Dxx		
Basic Price Without Additional Maintenance Support Plan				CHF	3,485	
Total Price With Additional Maintenance Support Plan				CHF		
Software Maintenance Support Plan Renewal Price For 1 Year				CHF	871	699-005-000-555-0x (Calculated @25% Of Prevailing Basic Price)
Software Maintenance Support Plan Renewal Price For 2 Year's				CHF	1,291	699-005-000-555-02 (Calculated @25% Of Prevailing Basic Price)
Software Maintenance Support Plan Renewal Price For 3 Year's				CHF	1,696	699-005-000-555-03 (Calculated @25% Of Prevailing Basic Price)

[illegible]

VM600^{Mk2} Pricing Strategy



VM600^{Mk2} Pricing Strategy

Channel Based Pricing Comparison Between Mk1 (Old), Mk1 New & Mk2

#of Channels	Price Variance Between Mk1 & Mk2 For MPS + CMS From 16 To 2048 Channels													
	Total Project Price (HW+SW)			Total Project Price (SW)			Per Channel Price			Price Variations (HW+SW)			Price Variations	
	Mk1-Old	Mk1-New	Mk2	Mk1-Old SW	Mk1-New SW	Mk2 SW	Mk1-Old	Mk1-New	Mk2	Mk1 Old v New	Mk1-Old vs Mk2	Mk1-New vs Mk2	Old v/s New SW	
16	CHF 44,350	CHF 41,532	CHF 36,411	CHF 11,800	CHF 8,982	CHF 8,982	CHF 2,772	CHF 2,596	CHF 2,276	-6%	-18%	-12%	-24%	
32	CHF 72,370	CHF 69,907	CHF 59,664	CHF 15,445	CHF 12,982	CHF 12,982	CHF 2,262	CHF 2,185	CHF 1,865	-3%	-18%	-15%	-16%	
48	CHF 110,075	CHF 106,457	CHF 82,918	CHF 20,600	CHF 16,982	CHF 16,982	CHF 2,293	CHF 2,218	CHF 1,727	-3%	-25%	-22%	-18%	
64	CHF 134,450	CHF 134,832	CHF 114,346	CHF 20,600	CHF 20,982	CHF 20,982	CHF 2,101	CHF 2,107	CHF 1,787	0%	-15%	-15%	2%	
80	CHF 183,400	CHF 171,382	CHF 137,600	CHF 37,000	CHF 24,982	CHF 24,982	CHF 2,293	CHF 2,142	CHF 1,720	-7%	-25%	-20%	-32%	
96	CHF 207,775	CHF 199,757	CHF 160,853	CHF 37,000	CHF 28,982	CHF 28,982	CHF 2,164	CHF 2,081	CHF 1,676	-4%	-23%	-19%	-22%	
112	CHF 232,150	CHF 228,132	CHF 192,282	CHF 37,000	CHF 32,982	CHF 32,982	CHF 2,073	CHF 2,037	CHF 1,717	-2%	-17%	-16%	-11%	
128	CHF 264,700	CHF 264,682	CHF 215,535	CHF 37,000	CHF 36,982	CHF 36,982	CHF 2,068	CHF 2,068	CHF 1,684	0%	-19%	-19%	0%	
192	CHF 398,875	CHF 386,357	CHF 316,724	CHF 65,500	CHF 52,982	CHF 52,982	CHF 2,077	CHF 2,012	CHF 1,650	-3%	-21%	-18%	-19%	
256	CHF 512,725	CHF 516,207	CHF 426,088	CHF 65,500	CHF 68,982	CHF 68,982	CHF 2,003	CHF 2,016	CHF 1,664	1%	-17%	-17%	5%	
320	CHF 643,075	CHF 646,057	CHF 527,277	CHF 82,000	CHF 84,982	CHF 84,982	CHF 2,010	CHF 2,019	CHF 1,648	0%	-18%	-18%	4%	
384	CHF 748,750	CHF 767,732	CHF 628,466	CHF 82,000	CHF 100,982	CHF 100,982	CHF 1,950	CHF 1,999	CHF 1,637	3%	-16%	-18%	23%	
448	CHF 862,600	CHF 897,582	CHF 737,830	CHF 82,000	CHF 116,982	CHF 116,982	CHF 1,925	CHF 2,004	CHF 1,647	4%	-14%	-18%	43%	
512	CHF 976,450	CHF 1,027,432	CHF 839,019	CHF 82,000	CHF 132,982	CHF 132,982	CHF 1,907	CHF 2,007	CHF 1,639	5%	-14%	-18%	62%	
640	CHF 1,228,975	CHF 1,278,957	CHF 1,049,572	CHF 115,000	CHF 164,982	CHF 164,982	CHF 1,920	CHF 1,998	CHF 1,640	4%	-15%	-18%	43%	
768	CHF 1,448,500	CHF 1,530,482	CHF 1,251,950	CHF 115,000	CHF 196,982	CHF 196,982	CHF 1,886	CHF 1,993	CHF 1,630	6%	-14%	-18%	71%	
896	CHF 1,676,200	CHF 1,790,182	CHF 1,462,503	CHF 115,000	CHF 228,982	CHF 228,982	CHF 1,871	CHF 1,998	CHF 1,632	7%	-13%	-18%	99%	
1024	CHF 1,895,725	CHF 2,041,707	CHF 1,673,056	CHF 115,000	CHF 260,982	CHF 260,982	CHF 1,851	CHF 1,994	CHF 1,634	8%	-12%	-18%	127%	
1280	CHF 2,364,950	CHF 2,552,932	CHF 2,085,987	CHF 137,000	CHF 324,982	CHF 324,982	CHF 1,848	CHF 1,994	CHF 1,630	8%	-12%	-18%	137%	
1536	CHF 2,804,000	CHF 3,055,982	CHF 2,498,918	CHF 137,000	CHF 388,982	CHF 388,982	CHF 1,826	CHF 1,990	CHF 1,627	9%	-11%	-18%	184%	
1792	CHF 3,251,225	CHF 3,567,207	CHF 2,920,024	CHF 137,000	CHF 452,982	CHF 452,982	CHF 1,814	CHF 1,991	CHF 1,629	10%	-10%	-18%	231%	
2048	CHF 3,698,450	CHF 4,078,432	CHF 3,332,955	CHF 137,000	CHF 516,982	CHF 516,982	CHF 1,806	CHF 1,991	CHF 1,627	10%	-10%	-18%	277%	

CMS Software Options & Price Comparison Conditions
 Standard Edition of Vibrosight (Ao2)
 No OPC Server & Client Tags In Old SW Price Versions
 No Additional Client Licenses (Coo)
 No Support Plan (Doo)
 No Rule Box

CHF 2,033	CHF 2,065	CHF 1,699	2.09%	-16.09%	-17.79%	53.05%
			1.61%	-16.40%	-17.73%	

VM600 System Configurator For Project Pricing

System Category (MPS/CMS/Both)	User Input	Mk1 (Old)	Mk2 (New)	Mk2
	MPS+CMS	2	2	2
# Dynamic Channels (MPC4)	64	16	16	16
# Static/Temp Channels (AMC8)	0	0	0	0
Relay O/P Per Channel Required	0	0	0	0
CMS HW Modules (XMV/MPC4 ^{Mk2})		4	4	16
Total No Of VM600 Racks Required		2	2	2
VibroSight Software Package Pricing	Yes	CHF 5,000	CHF 4,982	CHF 4,982
OPC Server	No	CHF -	CHF -	CHF -
OPC Client	No	CHF -	CHF -	CHF -
XMV/MPC4 ^{Mk2} Channel Licenses	64	CHF 15,600	CHF 16,000	CHF 16,000
Client License Qty	01	CHF 1,100	CHF 1,000	CHF 1,000
Additional S/W Support Plan Years	01	CHF 3,255	CHF 1,744	CHF 1,744
Rule Box	No	CHF -	CHF -	CHF -

1.85%

Pricing Example For
64 Channels Based
On New Pricing
Model

Mk1 v/s Mk2 Cost & Pricing For Projects		VM600 ^{Mk1} (Old SW Pricing)			VM600 ^{Mk1} (New SW Pricing)			VM600 ^{Mk2}			V In Cost	V In IPL	Remarks
Item		Cost	IPL	GM @ IPL	Cost	IPL	GM @ IPL	Cost	IPL	GM @ IPL			
VM600 With RPS & CPU		CHF 6,642	CHF 16,350	59%	CHF 6,642	CHF 16,350	59%	CHF 6,242	CHF 16,350	62%	-6%	0%	
HW Modules For MPS (MPC+AMC+RLC)		CHF 14,640	CHF 56,528	74%	CHF 14,640	CHF 56,528	74%	CHF 11,728	CHF 56,528	79%	-20%	0%	
XMV/ Firmware For MPC4 ^{Mk2} CMS		CHF 10,728	CHF 40,972	74%	CHF 10,728	CHF 40,972	74%	CHF -	CHF 20,486	100%	-100%	-50%	
Vibrosight Software Package Price		CHF 4,000	CHF 24,955	84%	CHF 4,000	CHF 23,726	83%	CHF 4,000	CHF 23,726	83%	0%	-5%	
Total Project Cost, Price & GM%		CHF 36,010	CHF 1,38,805	74%	CHF 36,010	CHF 1,37,576	74%	CHF 21,970	CHF 1,17,090	81%	-39%	-15%	

Apply Discount %

20%

Mk1 v/s Mk2 Cost & Pricing For Projects		VM600 ^{Mk1} (Old SW Pricing)			VM600 ^{Mk1} (New SW Pricing)			VM600 ^{Mk2}			V In GM \$	V In GM%	Remarks
Item		Price	GM\$	GM%	Price	GM\$	GM%	Price	GM\$	GM%			
Total Project Cost, Price & GM%		CHF 1,11,044	CHF 75,034	68%	CHF 1,10,061	CHF 74,051	67%	CHF 93,672	CHF 71,702	77%	CHF (3,332)	13.28%	

Target Price

CHF

69,403

Mk1 v/s Mk2 Cost & Pricing For Projects		VM600 ^{Mk1} (Old SW Pricing)			VM600 ^{Mk1} (New SW Pricing)			VM600 ^{Mk2}			V In GM \$	V In GM%	Remarks
Item		Disc%	GM\$	GM%	Disc%	GM\$	GM%	Disc%	GM\$	GM%			
Total Project Cost, Price & GM%		50.00%	CHF 33,393	48%	49.55%	CHF 33,393	48%	40.73%	CHF 47,433	68%	CHF 14,040	42.05%	
		Target Price Too Low			Target Price Too Low			Price OK					

VM600^{Mk1} Phase Out Plan

Why Phase Out VM600^{Mk1} ?

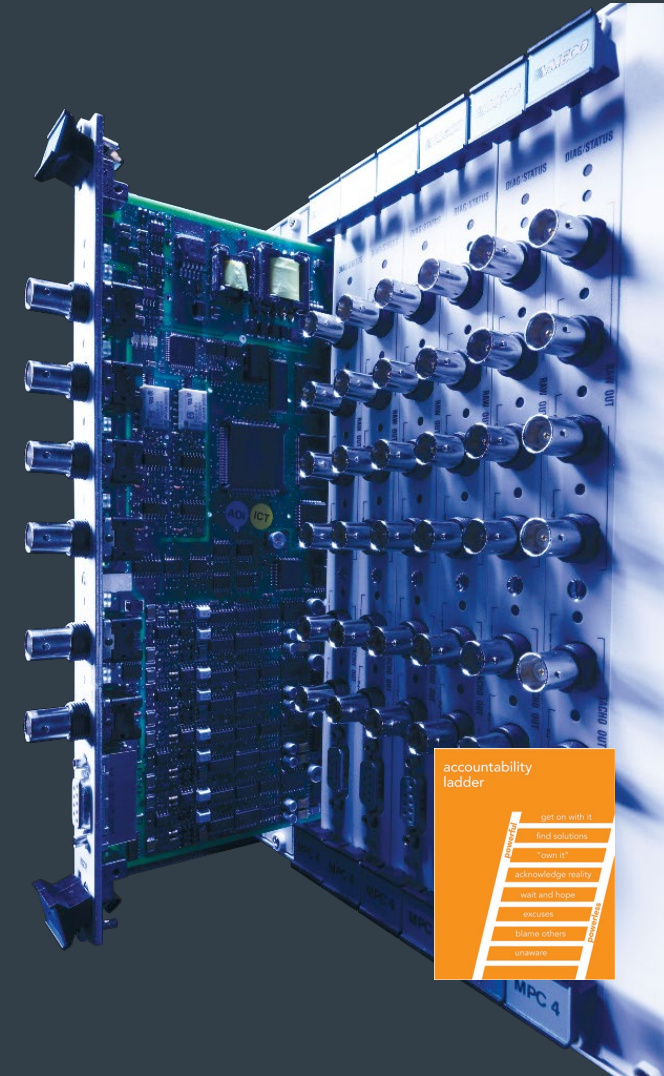
❑ Components Obsolescence

- Limited Capacity To Produce VM600Mk1 System Components
- Can Produce 25-100 VM600^{Mk1} SYS With Current Stock
- CPUM, MPC4 & AMC8 Most Severely Impacted
- Other Cards Expected To Follow

❑ Contractual/Spares Support Commitments To Customers For 5-10 Years

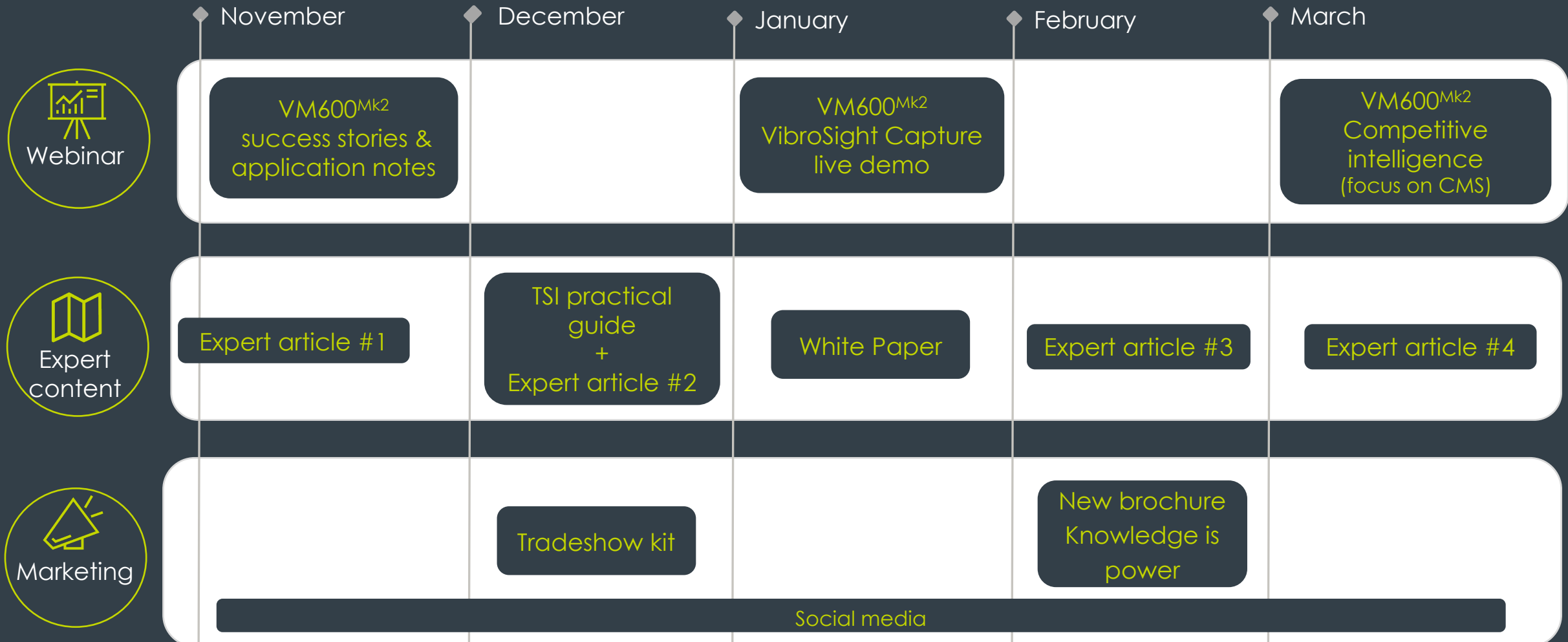
❑ Actions Proposed/Taken

- ✓ VM600 Mk1 – Stop Offering! & Push To Convert All Open Quotes To Mk2
- ✓ Action Team & Steering Committee For Driving Key Actions
- ✓ Communications...Internal & External...Coming Shortly...
- Promote Mk2 For All New Orders/Opportunities
- Upgrade CPUM-CPR2 & MPC4^{Mk1} to MPC4^{Mk2}
- Accelerate Mk2 Production, Deliveries & Development Activities etc..



▼	Functional Category ▼	Priority ▼	Action ▼	Specific Action Details ▼	Details Steps On Action ▼	Owner ▼	Due Date ▼	Remarks ▼
1	Product Management	High	Address CPUM Obsolescence	Announce CPUR2 As An Official FF (Form & Fit) Replacement For CPUM... except for display & Modbus RTU...	1. Announce LTB & Osolecense of CPUM 2. Check Compatibility, Configuration etc. etc. 3. Keep CPUR2 & CPUMk2 Separate as 2 separate products 4. Write compatability guide for CPU's 5. Replace CPUM of all open VM600SYS Order's to CPUR2 6. Any order for Loose CPUM should be replaced with CPUR2 7. Supply chain update on CPUR2 (increase forecast etc.)	MHAF	29-10-2021	
2	TCOE	Medium	Address CPUM Obsolescence	Finalize 3rd Party Display Solution & Modbus TCP To RTU Conversion Solution For CPUR2	1. Standard display package based on MPS2 2. TCOE to standardise display & Modbus RTU solution	RMAD	31-12-2021	
3	Sales & Marketing	High	Address CPUM Obsolescence	Stop Selling CPUM On New VM600Sys Orders	1. Identify All Open CPUM Orders (Loose & VM600SYS) 2. Write a letter to all open orders for conversion etc. 3. Replace CPUM of all open VM600SYS Order's to CPUR2 4. Any order for Loose CPUM should be replaced with CPUR2	SWAMI	29-10-2021	Swami to draft Internal Memo for CPU, MPC4 & Mk1 obselecense Letter for customer linking chip crisis with certain Mk1 modules etc. etc...
4	Product Management	Medium	Address MPC4Mk1 Shortage/Obsolescence	Allow Mk2 & Mk1 MPC4 to Co-exist	1. Product Management confirms Mk1 & Mk2 can coexisit 2. Precautionary steps to be taken in configuration (TechPub) 3. Customer must replace MPC4, IOC4T 4.Enable CPUR2 to work with MPCMk2	MHAF	31-03-2022	write an upgrade methodology/Technical publication if customer would like partial upgrade from Mk1 to Mk2 cards in a rack
5	Product Management	Medium	Address MPC4Mk1 Shortage/Obsolescence	RLC16Mk1 Compatibility With MPC4Mk2	1. Product Management confirms Mk1 & Mk2 can coexisit 2. Precautionary steps to be taken in configuration (TechPub)	MHAF	31-03-2022	
6	TCOE	High	Address MPC4Mk1 Shortage/Obsolescence	Tech. Pub On MPC4 Mk1-Mk2 Replacement	Techpub should list: 1. Procedures for replaceing Mk1 to Mk2 Modules in a Mk1 rack 2. User Manual for Mk2 rack 3. Ordering Guide, config serviec support of Mk1 to Mk2 etc... 4.	RMAD	31-12-2021	
7	TCOE	Medium	Address MPC4Mk1 Shortage/Obsolescence	MPC4Mk2 with All Capabilities as MPC4Mk1 Tech Pub For Siemens Application Scenarios	1. Product Management confirms Mk1 & Mk2 can coexisit	MHAF	30-12-2021	Michael to address specific request from Chris Bode on the Siemens specific configuration requirements
8	TCOE	High	Accelerate Mk2 Program	Expedite SIL2 Certification (Q1-2022)	1. SIL Evaluation with Exida India based on current Mk2 design & capabilites 2. SIL efforts to be coordinated with TCOE, Vivek	RMAD VTYAG	15-11-2021	
9	Product Management	Medium	Accelerate Mk2 Program	Bridge Feature Gaps (Display, CPUR & AMC8)	1. AMC8 will be ready by Q1-2022 2. Display for Mk2 will be standardized by TCOE (Q4-2021) 3. CPUM ^{Mk2} (Reducndant Modules in a rack) Not planned until 2023	MHAF	31-03-2022	Product management to ases the requirement of reducdnacy & provide update on the possibilities of the requirement of redundant modbus modules
10	Product Management	Low	Accelerate Mk2 Program	No Further Program Delays (CMS, SIL etc.)	No actions, its more a comment & we need to ensure pace of developments & supply chain activites assured for Mk2	NA	NA	
11	Sales & Marketing	High	Enhance Spares Availability Time Of Mk1 Cards	Announce LTB ASAP	Swami to draft letter for LTB/Chip crisis etc. stating all VM600Mk1 SYS shall be automatically converted to VM600Mk2 orders	SWAMI	30-10-2021	
12	Sales & Marketing	Medium	Enhance Spares Availability Time Of Mk1 Cards	Set Stock For Spares Lifecycle Commitments	Sales to define stock needs for special customer comittments already being done for Hydro Qubec in Canada	Swami	30-10-2021	stock 10x years spares for customers who have comittments etc Also inform them of LTB now...(except for HQ)
13	Sales & Marketing	High	Enhance Spares Availability Time Of Mk1 Cards	No “Loose” Card Orders Of Mk1 On IPL	CAR's to block all loose orders for Mk1 modules on IPL price	SWAMI	30-10-2021	Followup with approval process & implement process with Sacha
14	TCOE	No Action	Enhance Spares Availability Time Of Mk1 Cards	Repair Campaign For Mk1 Cards	Repairs not viable	NA	NA	
15	Sales & Marketing	Medium	Improvise Commercial Positioning Of Mk1	Increase Mk1 SYS & Spares Price By >35%	To be discussed with Marek & finalize	SWAMI	30-10-2021	
16	Sales & Marketing	High	Improvise Commercial Positioning Of Mk1	No More Mk1 SYS Sales For New Orders	Swami to draft an internal Memo for no new Mk1 SYS orders with exceptions 1. Siemens & Hydro Qubec 2. Applications not supported by Mk2 3. Orders in final negotiations/closure 4. Try to conveert/switch if possible all open Mk1 orders	Swami	30-10-2021	Swami to discuss with sach/Abel for all open Mk1 SYS orders in order book
17	Sales & Marketing	High	Improvise Commercial Positioning Of Mk1	Screen & Approve All Open & New Mk1 Opp.	Swami to work on internal Memo for this step 1. All new Mk1 sys quotes to be approved by VP SSM 2. All spares oppurtunity to be approved by Regional Sales Director	Swami	30-10-2021	
18	Sales & Marketing	No Action	Accelerate Mk2 Marketing Campaign	Aggressive, Sales Pitch For Why To Switch	Just an recommende action, no specific actions being derived from this	NA	NA	
19	Sales & Marketing	High	Accelerate Mk2 Marketing Campaign	Negotiate Mk2 Transition With Siemens	Raghu to lead the effort & make a proposal during Oct PL review	RHEG	30-10-2021	
20	Sales & Marketing	Low	Accelerate Mk2 Marketing Campaign	Incentivize Open Mk1 Orders To Switch	No action for now	NA	NA	
21	Sales & Marketing	Low	Accelerate Mk2 Marketing Campaign	Incentivize RSM's & Sales Channels For 1 Year	No action for now	NA	NA	
22								
23								

MARKETING SUPPORT - **TIMELINE**



MARKETING SUPPORT – EXPERT CONTENTS

Expert articles

#1 No customers left behind

#2 TSI measurements – a forgotten art?

#3 Supporting Your Decisions with VibroSight's Diagnostic Rule Box

#4 Managing by exception: the power of alarming in your condition monitoring software to prevent costly shutdowns.

Application notes: TSI a primer (goes with expert article #2)

White Paper: VM600^{Mk2} A second-generation architecture for a New Era

NEW “Knowledge is power” 2 versions :

- **V1:** Focus on power gen application
Focus on Mk2 with an comprehensive article on
“Integrating a machinery protection platform into your plantwide ecosystem”
- **V2:** Focus on Hydro application
Focus on VibroSmart with an comprehensive article on
“Integrating a distributed machinery protection and condition monitoring platform into your large hydro power plant ecosystem”

MARKETING SUPPORT – TEASER



The VM600Mk2

Our second-generation VM600 platform retains all of the innovation inherent in the first-generation product while addressing evolving marketplace needs. True to our promise, it does this without straining our customers and their large installed base of more than 8,000 VM600Mk1 systems – systems that encompass 240,000 VPC4MTM protection channels and 88,000 CMV/CMV/CMC condition monitoring channels. Because the VM600Mk2 uses the same backplane and power supplies as its predecessor, it is not necessary to replace a rack in order to upgrade modules. This also means that existing racks can incorporate a mix of first-generation (Mk1) and second-generation (Mk2) modules if desired, and that Mk2 modules can be used as spares for Mk1 modules.¹ In addition, the Mk2 and Mk1² modules have not changed and continue to be perfectly synchronized between the new environments and the condition monitoring environment can be used for nuisance warning while allowing an additional step of warning for earlier warning on any desired parameter – whether a parameter from the underlying protection system or a parameter created only for use in the condition monitoring environment.

Key improvements in our second-generation architecture include:

- Integrated condition monitoring**
It is no longer necessary to use VPC4 cards for protection and separate CMV/CMC cards for condition monitoring. The functionality of the VM600Mk2 is now built-in to the new VPC4MTM cards. Not only does this eliminate the cost of unnecessary redundant hardware, it eliminates the duplicate data issues inherent in two separate signal processing paths and alarm processing paths that were noted in the section on integration. Condition monitoring can now focus on supplementary signal processing and alarming to augment the best protection system measurements – not recreating them. This also speeds the configuration process because the configuration elements that are common to both the protection and condition monitoring systems no longer need to be duplicated. Configuration in the condition monitoring environment thus adds to the best protection configuration. Alarms and data are perfectly synchronized between the new environments and the condition monitoring environment can be used for nuisance warning while allowing an additional step of warning for earlier warning on any desired parameter – whether a parameter from the underlying protection system or a parameter created only for use in the condition monitoring environment.

The new VPC4MTM module (left) and its companion CMV module (right) provide integrated protection and condition monitoring, eliminating the need for a separate VM600 module.

The new VPC4MTM module provides integrated condition monitoring functionality identical to that of a separate VM600 module, but it is smaller that completely integrates the protective function (Status) from the condition monitoring function (Data). One of its predecessors, the user interface can be shared between protection and condition monitoring functions via the rack's backplane.

The new CMV module is a stand-alone unit for condition monitoring, such as when connected to a separate machinery protection system from another turbine. The CMV module provides cost-effective condition monitoring functionality for all channels in a single rack slot. VPC4MTM modules and their associated machinery protection functions are not required.

¹ Mk2 modules are configured using our **ULTRASAFE PROTECT** software, Mk1 modules are configured using our **ULTRASAFE PROTECT** software. Also, VPC4MTM modules can only be paired with their companion CMVTM modules and cannot use the existing CMVTM.

² VPC4MTM modules retain the ability to share output signals with an associated Mk1 module, but can also provide integrated condition monitoring functionality and thus entirely eliminate the need for a separate condition monitoring module for vibration measurements.

Turbine Supervisory Instrumentation

A Primer

Michael Heller
Sr. Product Line Manager
Protection & Monitoring Systems

A shift from steam to gas

At one time, a majority of the world's electrical power generation came from steam turbines coupled to generators. Whether the steam was produced by burning either conventional fossil fuels such as coal, gas, or oil, or by the heat from nuclear fission in a reactor, the process was essentially the same: heat the water to steam, expand it through a turbine coupled to a generator, and recycle the depleted steam/water to heat it again through the boiler or reactor.

Today, generation methods to meet the global power demand have largely shifted to gas turbines instead of steam turbines, augmented by a much higher percentage of renewable sources (wind, solar, geothermal). This shift has occurred for two reasons: gas turbines are more efficient than steam turbines in extracting energy from a given amount of fuel, and gas turbines create fewer pollutants (emissions per MW of generation). The world's most efficient gas turbines, for example, can today realize efficiencies approaching 45%. In comparison, plants comprised solely of steam turbines rarely exceed 35% efficiency.

The persistence of steam turbines

Regardless, a sizable installed base of steam turbines still exists around the world and will remain for the foreseeable future. Also, installation of new steam turbines will continue as the waste heat from a gas turbine's exhaust can be used to boil water and create steam for a steam turbine. Such plants are known as "combined cycle" facilities because they combine the thermodynamic cycles of both gas and steam turbines in the generation of electricity. As a result, they are more efficient than so-called "simple cycle" plants – whether comprised solely of gas turbines (typical efficiency of 35-40%) or solely of steam turbines (typical efficiency of 30-35%). In contrast, a typical combined cycle plant boasts an efficiency of 50-60%. This added efficiency occurs because heat from the gas turbine that formerly went up the exhaust stack is instead routed through a HRSG (Heat Recovery Steam Generator). The resulting steam is expanded through a turbine that drives another electrical generator, producing more power without the need for any incremental fuel. Identical fuel content in a combined cycle plant thus produces more MW of electricity than in a similarly sized simple cycle gas turbine plant.

Size matters

One of the ways that steam turbine efficiency is optimized is through size. One large steam turbine is more efficient than multiple small steam turbines operating in parallel to produce an equivalent output. In a fossil-fueled power plant, a typical steam turbine will range in size from 50MW to as much as 1200MW (Figure 1). In a nuclear power plant, a typical steam turbine will range in size from 800MW to as much as 1770MW. The massive size of these machines means that rotors are often very long. Also, because the casing of a steam turbine is designed as a pressure vessel, it is typically very thick (200 mm or more) and expands/contracts more slowly than the rotor. These and other factors combine to result in a suite of measurements that are unique to large steam turbine generation and supplement the conventional radial vibration, phase reference, bearing temperature, and thrust position measurements typical of all rotating machines with fluid film bearings.

Figure 1

A typical steam turbine generator consisting of HR (H) and L (L) units, along with generator and exciter. The steam enters the IP turbine case from the bottom and exits on the top where it flows to both IP turbines in parallel. Note that the generator and exciter are shown in the photo, but not in the corresponding illustration. Images courtesy of Ontario Power Generation.

Feedback, Comments & Questions ?

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Thank You.....