# Case Shi Xm Ug'Acb]hcf]b[']b'U) \$\$\$!ZHXYYd'K Y`VcfYi g]b[ 85 Gž8 HGÉba 8 GG



# Case Study – Gas Monitoring ]b'K Y`VcfY

- ="FYgYUfVl(`Ach]jUh]cb
- =" 85 Gž8 HGžUbX 8 GG F Ygi hg
- =/" Autom UHYX'8 YHYVF]cb'i g]b[ 'A UMY ]bY'@/Ufb]b[
- J" Distributed Pressure Sensing us ]b[ '85 G'UbX'8 HG
- J=" FIOW FUNYZea '85G
- J="; Ug'Jc]X': fUWf]cb

### Research Mchjj Uhjcb-6`ck ci h<sup>P</sup>fYj Ybhjcb



#### Dfc\_^YWhik]h\`BUhjcbU`5WUXYamicZGWJYbW¥gĐ; i`ZÁ FYgYUFW\`Dfc[fUa



# ; Ug']b Riser Monitoring i g]b[ F]VYf Cptic GYbgcf





#### Fesults from Distribi MX'5 coustic Gensor (85 G



### FYgi `hg'ZcaDistributed TYa dYfUi fYSYbgc fBHGL



#### FYgi `hg'ZcaDistributed GhfUJbGYbgcffBGGL

Oil/Gas Deposit





#### 8:CG'G][bUProcessib['Ub: 8Ybc]g]bg





#### Data Compression and Cloud Processing

8 ƯƯ7₀mpression F€Á^&Á¢ÁF€Ê€€€Á¢Á €€€₽ÐĚ ÁMÁG€€Á¢ÁF€Î Ååææá∱[ ∄ o G€€Á¢ÁF€Î ¢Á ÁM €€Á¢ÁF€Î ÁdÁEÈ ÁÕÓ



Real-time data streaming 4 "Uhency % !! \$ sec



FYZYFYbVW.`Ù@ek{æ£AREA vÁedEA% ^||EÙ&ea^AT`|@]@ee^ÁØ[, ÁÔ@ebæ&c^lãæaã}}ÁBÁxædãæaã}}ÁV^ð]\*ÁÖãdãa`c^åÁØãa^lÁJ]œ&ÁD^}•[¦•Á[¦ÁÕæÆSã&ÁT[}ã[¦ð]\*EÁJ]œ&ÁØ¢]OÅÇĜDKÌÏÏHEÌÌÏÌË Væbő|æ£AREÊÙ@ek{æ£AREEÁGE/EAGA^æč¦^ÁÔ¢dæ&cã}}Á/^&@;ã`^•Á{¦Á¤[ã^ÁÖãdãa`c^åÁGB{`•œ&ÁÙ^}•[¦ÁÖææÁQã``ã^åÁjÁæÁY ^||à[¦^+EÁG]]®\*åÁJ]œ&

### AUW ]bY @/Ufb]b[ 'UbX'5 i hca Uh]cb



Aihca UhYX`XYhYWjcbig]b[ʻa UNX]bY `YUfb]b[ʻcbʻZjVYf`XUHJ







#### 8]ghf]Vi hYX<sup>®</sup>fYggi fYA YUgi fYa Ybh



Elapsed time (hrs)

#### Machine Learning and Automation' Distributed Pressure Gensing





D5 H9 BH. Ù@ek{æÉRÈÉÔ\^&@\,`ÉÔÈÈÉÔã/dâtů@eð\*Á•ð\*Á•ð\*ÁØâ^¦ÁU] æKÆÖã dât`d°åÁŒA{s\*@åÁÆÅÖã dât`d°åÁ/^{]^¦æt`¦^ÂÛ^}•[/ÉÚæe^}dÚ^}að\*ÁÅ HDFÌJÉ HHÁŒGFÈ D5 D9 F. Ô\^&@\,`ÉŐÈÈÉÛ@ek{æÉRÈÆŒGFÈÄY^||Ë&æ4^&a^{{}}á\a} {[}•dæat}}Á; Ásã dât`d°åÁ; \^••`¦^Á^}•ð\*Á•ð\*Áaa^\É]] æKÖŒÙÁe}åÆÖVÙÄEÚ&ð} æ&AŰ^][¦orÁÇÞæt`¦^DKFKGÍ €ÍÁÇ€Œ

## F`ck 'A YUgi fYa Ybhi g]b [5 G



:69 <sup>-</sup> 6UbX <sup>-</sup> fknĽ#Á FAG	9l dcbYbhjƯ ?₃ <sup>.b.3</sup>			@bYUf ?`₄ ''-b'₄			7 i V]₩Á ? ` <sub>5</sub> <sup>5</sup> ''- <i>Ď</i> 5		
	Ü^*¦^•• <b>ā</b> [}Á\$k}•œa);œ		ÜGÁ	Ü^*¦^∙∙ąį}&[}•œ},œ		ÜG	Ü^*¦^••ąį}Á&į}•œa)o•		ÜG
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&\$\$`!`) \$\$	HÈĴÏ¢F€ <sup>Ë€J</sup>	FÈĤ ¢F€ <sup>ëG</sup>	€ÈÌ	Í ÈĤ ¢F€ <sup>⊞</sup> €	ËHÊÎÁ¢ÁF€ <sup>ë</sup>	€ÈÎ	Î ÈJ¢F€ <sup>⊭í</sup>	ÏÈGJ¢F€ <sup>≞</sup>	€ÈÌ
FAG	Ϊ È̀ J¢F€ <sup>≣</sup>	FÈFH¢F€ <sup>ËG</sup>	€ÈI	Í Ë G¢F€ <sup>≞</sup>	ËGËÌÁ¢ÁF€ <sup>®</sup>	€ÈÏ	ÎÈ΢F€ <sup>⊞</sup> ∺	GÈĜ ¢F€ <sup>∄</sup>	€ÈI

D5 D9 F. Væàlő |æÉÆÊÙ@ed{ æÉÆÈÆŒG-EÄÄÒ{ | å 88æ4Ô[ ¦ | ^|æaā[ } • Á{ ¦ ÁÚ¦ ^ å 88æ3 \* ÁØ|[ , ÁÜæe^• Á • ā] \* ÁÖãs diāblie/så ÁØ84jañ æe^å Á, ão@év ^||à[ ¦ ^ Áæ} å ÁØ|[ , ÁŠ[ [ ] ÁÖæææ• ^ æ ÁÈÈÚÚÒÁÚ¦[ å \* &a U] ^ ¦æaā[ } • ÁR[ ` ¦}æ4ÂÇÙ ` à{ ãæ^åDÈ

#### ; as Jc]X': fUW]cb'i g]b85G





## Nia YfjWJ'Ghulations

˝ÁŒÁå¦ãdЁ¦ǐ¢Á{[å^|Áàæ•^åÁdæ}•ã^}ơÁ,^||à[¦^Áç,[Ё]@æ•^Á{[, Á\*ã, ǐ|æe[¦Á,æ•Á'dājã ^åÈ ˝ÁÕ[ç^¦}引,\*Á˘ĭæeā[}•Ásd-Áç,[Á{æ•Á&[}•^¦çæeā[}Ášĭĭæeā]}á×ĭĭæeā[}•Ásd)åÁ[}^Á{[{ ^}č{ Á&[}•^¦çæeā



/^ مَعْتُ لَكُمْ تَعْلَمُهُمْ يَعْمُلُمْ يَعْمُلُمْ يَعْمُلُمْ يَعْمُلُمْ عَلَامَ اللَّهُ الْحَمْ الْحَمْ الْحَ à ( اللَّا عَلَامَ اللَّامَ اللَّامَةِ مَعْمُ مَعْ اللَّامَةِ عَمْمُ مَعْ اللَّامَةِ عَمْمَ مَعْ اللَّامَ اللَّ à ( اللَّا عَلَامُ مَعْ اللَّا عَلَامُ اللَّا مَعْ مُعْمَ عَلَامُ عَلَامُ عَلَامُ عَلَامُ عَلَامُ عَلَامَ عَلَام

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# RYgi`hg'Ì BiaYf]WUG]ai`Uh]cb





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## Acknowledg Ya Yb

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- Gdc bgc fs: Þæð } æ CBæå^{ ^ Á Ù&ð } & •, Exxon, Chevron, ÖUÒÊÛ@ || É CEÓ [ æå Á Ü^\*^} •



