

Improved AST's Based on Real World FCV Data

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This presentation does not contain any
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IMPROVED AST's BASED ON FCV DATA

Objectives of project

Technical Task – 10*	Barriers	Components
Develop Protocols for Testing	Durability	Membranes
Experimentally Determine Long-Term Stack Failure Mechanisms	Performance	Electrodes
Characterize Component and Stack Properties Before, During and After Operation	Water Management	Gas diffusion media
	Start-stop / Transient Operation	(Seals)

*From 2007 DOE Multi-Year R,D,&D Plan

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DOE Technical Targets

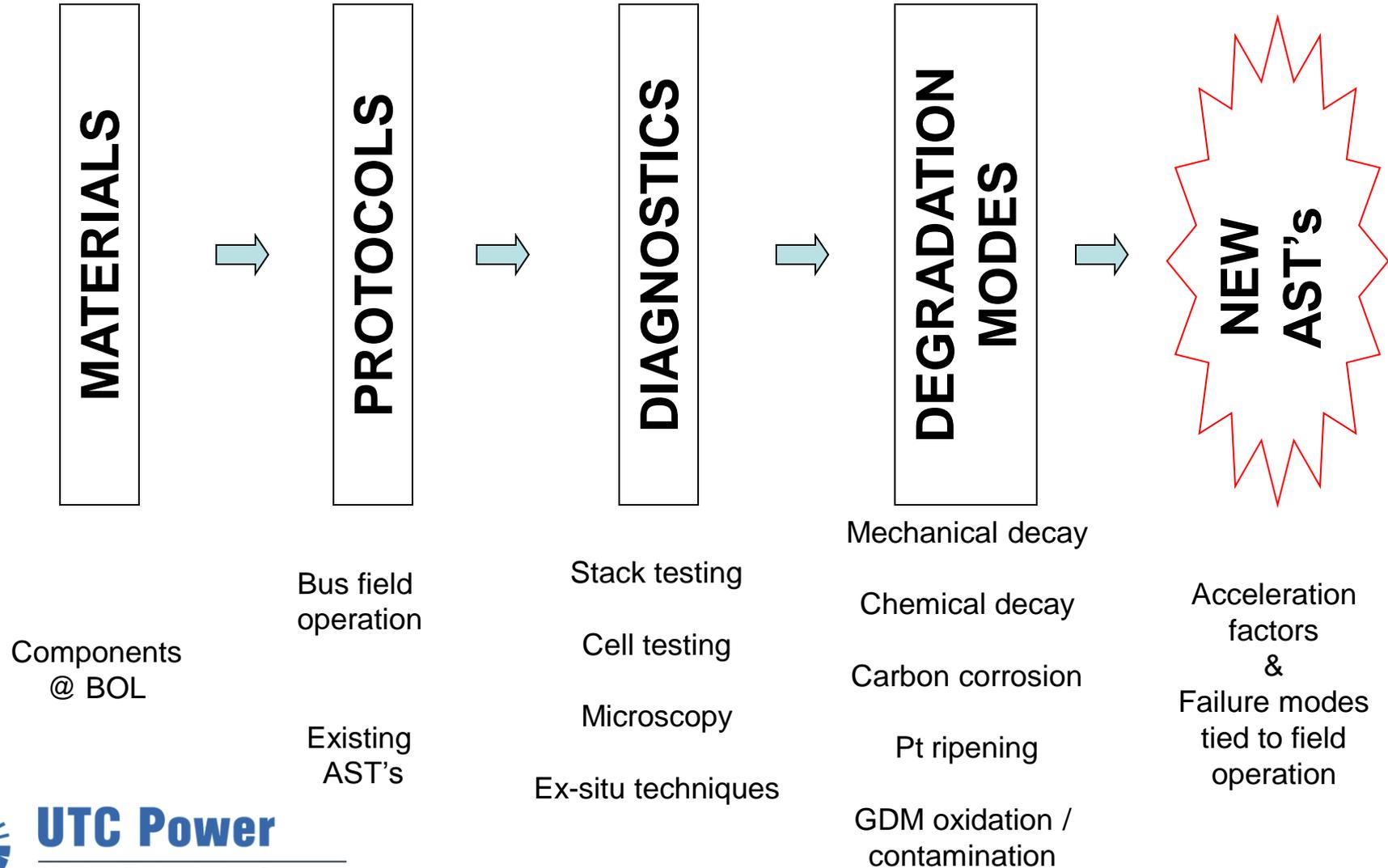
Technical Targets	2010 target*	2015 target*
Durability with cycling At operating temp of $\leq 80^{\circ}\text{C}$	5,000**	5,000**
At operating temp of $>80^{\circ}\text{C}$	2,000**	5,000**
Performance degradation	10%**	5%?

* from 2007 DOE Multi-Year R,D,&D Plan

** not adequate for fleet applications

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Program approach

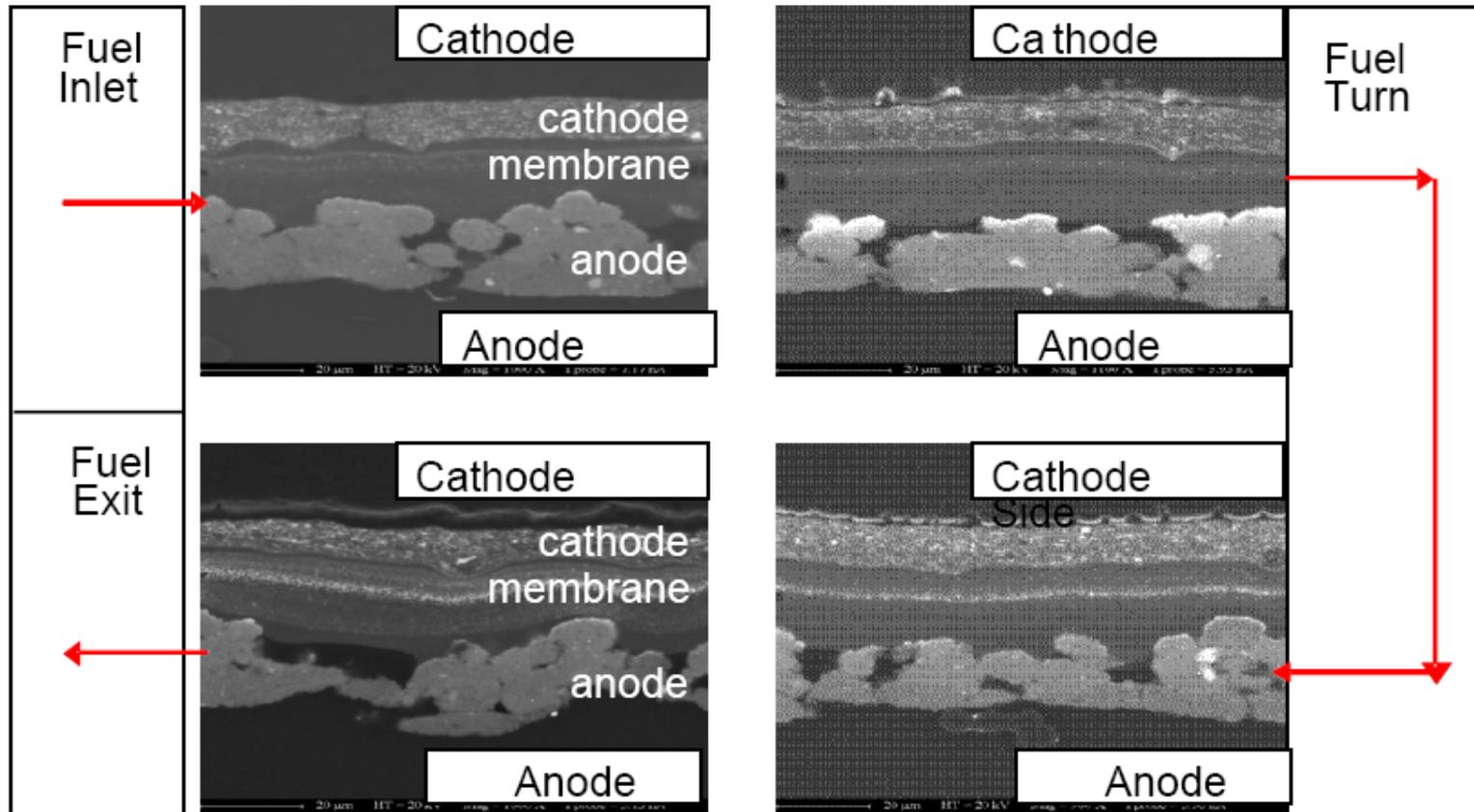


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Degradation in real world cell

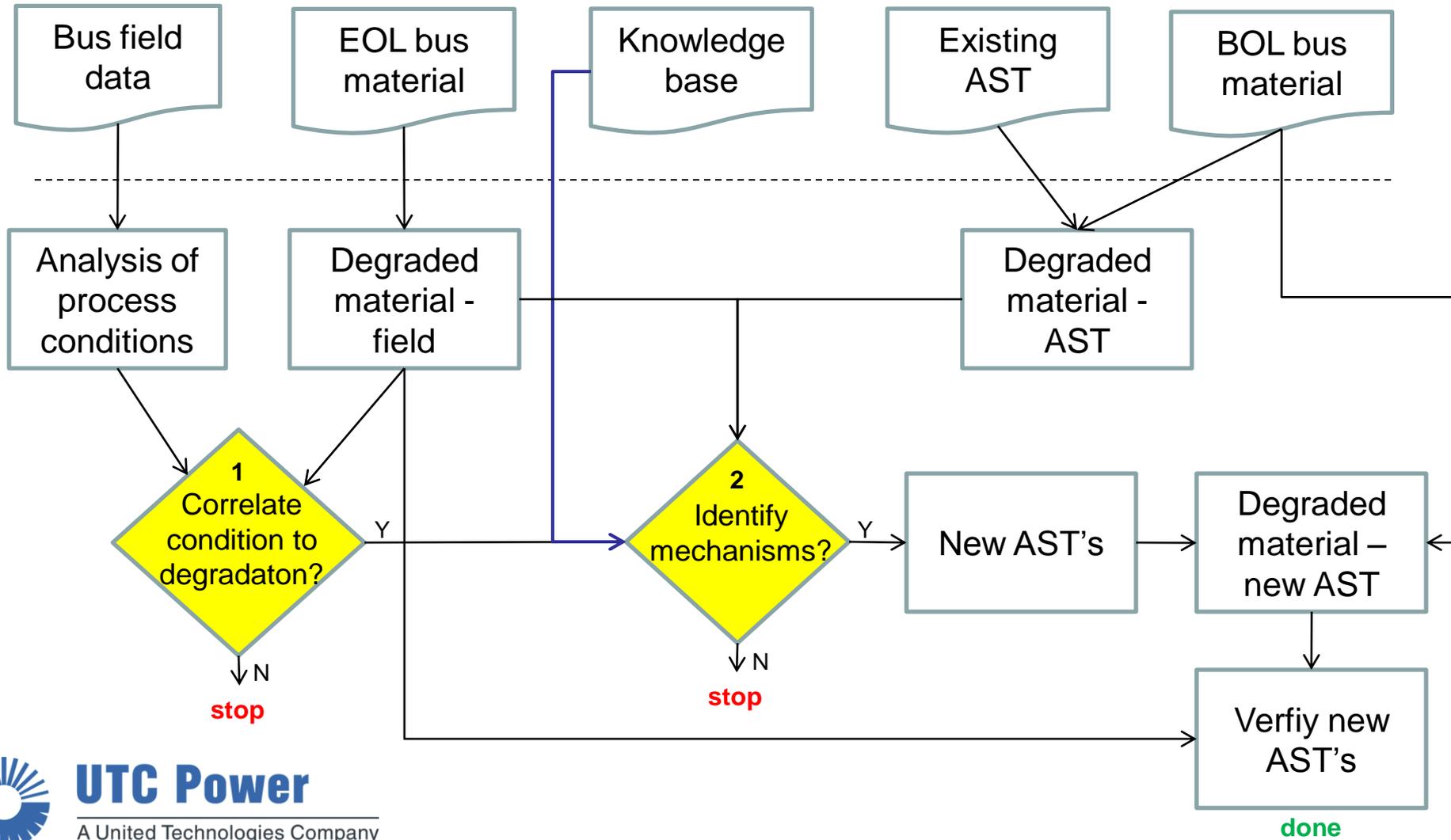


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Work flow & go/no-go



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Program team



Real world components from buses
Analyze operating conditions
In-situ diagnostics - stack
Correlate degradation mechanisms



Execute existing AST's
In-situ diagnostics - cell
Develop new AST's



Ex-situ diagnostics
(SEM, EPMA)

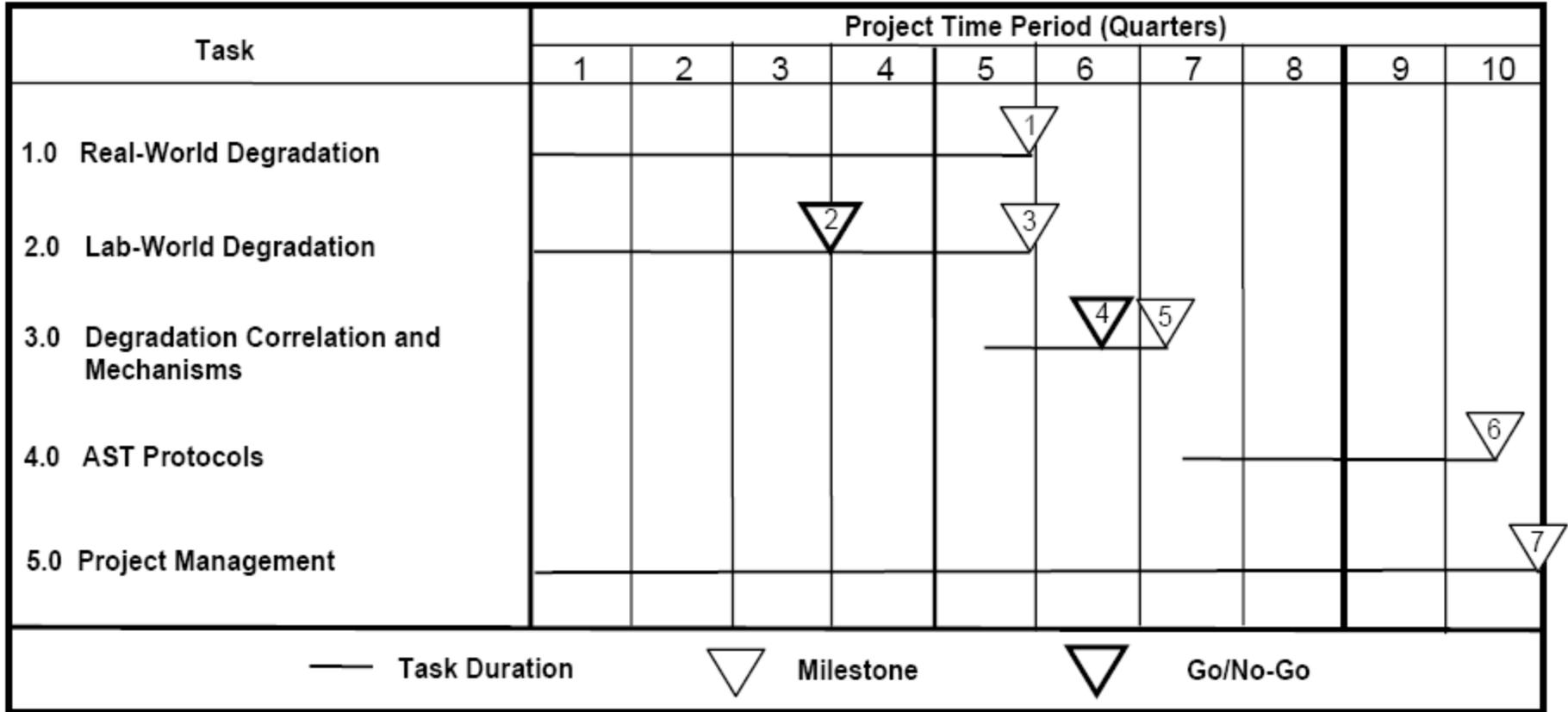


Ex-situ diagnostics
(TEM)



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Project timeline



- Go / no-go
- ▽2 Process conditions correlate to degradation?
 - ▽4 Mechanisms identified to proceed with 4.0?

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Program budget (total program)

GFY '09	\$478,609
GFY '10	\$1,187,500
GFY '11	\$1,312,754
GFY '12	\$868,355

Cost share – 20%



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