

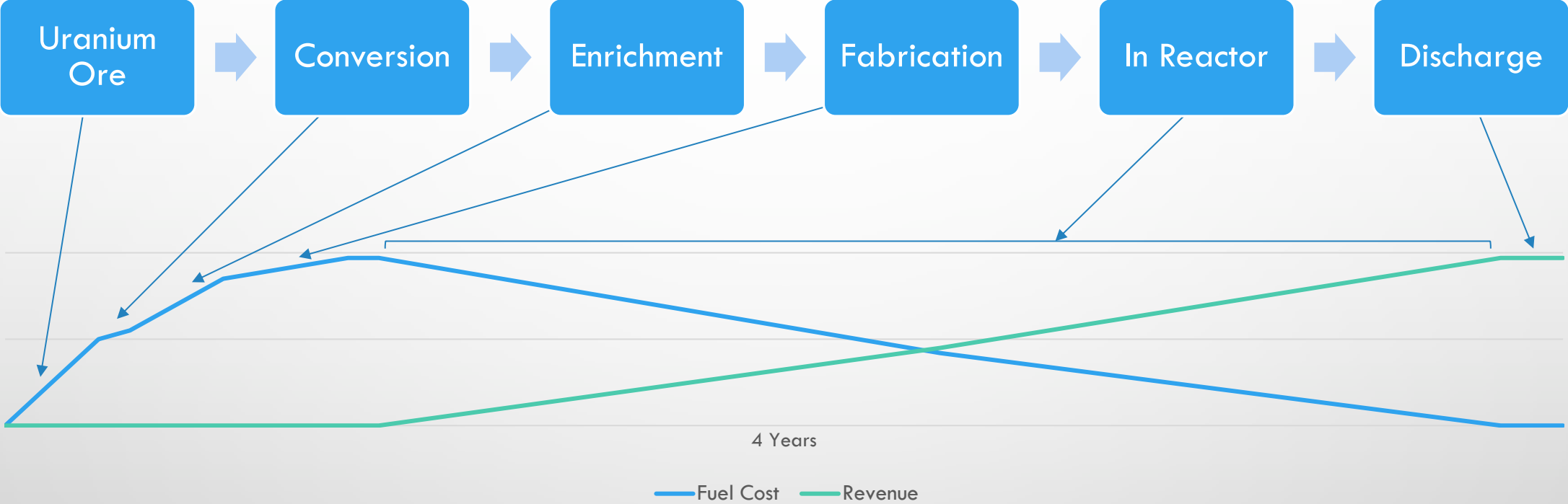
SURFNONLINE

for

Nuclear Fuel Cycle Management

NUFMAP is a servicemark of HTH Associates, Inc.

NUCLEAR FUEL CYCLE



NUFMAP

- NUFMAP - Nuclear Fuel Management and Accounting Process
- Over 40 years of industry experience
- Currently in regular use by five nuclear operators and owners
- NUFMAP is the set of tools for managing the nuclear fuel cycle
- Fuel Management
 - GEM PACKAGE General purpose economic modeling
- Accounting
 - SNAP-FINANCE assembly expense amortization and subsidiary ledger
- Integration
 - Modular design
 - Fuel Management provides assembly projections for Accounting
 - Accounting actuals are starting point for Fuel Management and support variance reporting

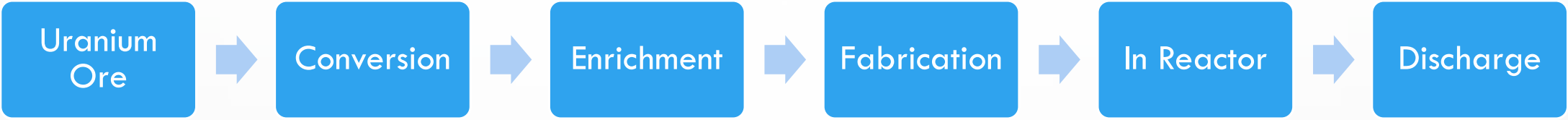
KEY NUFMAP FUEL MANAGEMENT MODULES

- GEM PACKAGE
 - GEM-GPM (Generation Planning)
 - Project Cycle Lengths
 - Project Monthly Reactor Generation
 - LPGEN (Loading Pattern Generation)
 - Convert Detailed 3-D Simulator Results to GEM-XY 2-D Input
 - Detailed Fuel Assembly Design Data
 - GEM-XY (2D-Multi Cycle Simulator)
 - Project Multi-Cycle Core Loading Requirements
 - Project Batch Residence Time in Reactor
 - Project Batch Burnups each month in each cycle
 - GEM-ESM (Enhanced Supply Module)
 - Fuel Commodity Procurement Plan
 - Project Capital Fuel Cash Requirements
 - GEM (General Economic Model)
 - Project Monthly Nuclear Fuel Expense Rates
 - Discounted Revenue Requirements
 - Provide Projected Nuclear Fuel Information for Corporate Use
- Where used
 - Regulated utilities
 - Merchant plants
- How Used
 - Fuel cycle economics
 - Justify initial build
 - Optimize multiple unit fleets
 - License extension decisions
 - Justification of rates to regulators
 - Impact of plant changes
 - Optimized fuel cycle design
 - Commodity procurement decisions
 - Resource planning
 - Total production costs

KEY NUFMAP ACCOUNTING MODULES

- SNAP-Finance
 - PRO Tools (PROGEN, PROPAC, PROLIM, etc.)
 - Fuel Expense and Amortization
 - Amortization Database Management
 - Integrates with GEM-XY
 - INTRAC
 - Subsidiary Ledger for Nuclear Fuel
 - Database of Invoices and Commodity Balances
 - Database of Actual Monthly Generation and Fuel Expense
 - REPORT
 - Standard Reporting for Subsidiary Ledger
 - Transfer files for GPM, PRO Tools
 - NUTRAC/PROTRC
 - Fuel Accountability
 - Assembly Cost Calculation and Allocation
 - TRANSESM
 - Calculates Lot Balances from Subsidiary Ledger
 - Integrates with GEM-ESM
- Where used
 - Regulated utilities
 - Merchant plants
- How Used
 - Fuel accounting
 - Adjust expense rates based on operations
 - Fully expense fuel at discharge
 - Fuel transaction database
 - Corporate reporting / variance reports
 - Resource utilization
 - Total production costs

NUFMAP MANAGES THE NUCLEAR FUEL CYCLE



Fuel Management

- Multi-Cycle Core Loading Requirements
- Fleet Fuel Commodity Procurement Plan
- Capital Fuel Cash Requirements
- Corporate Reporting / Variance Reports

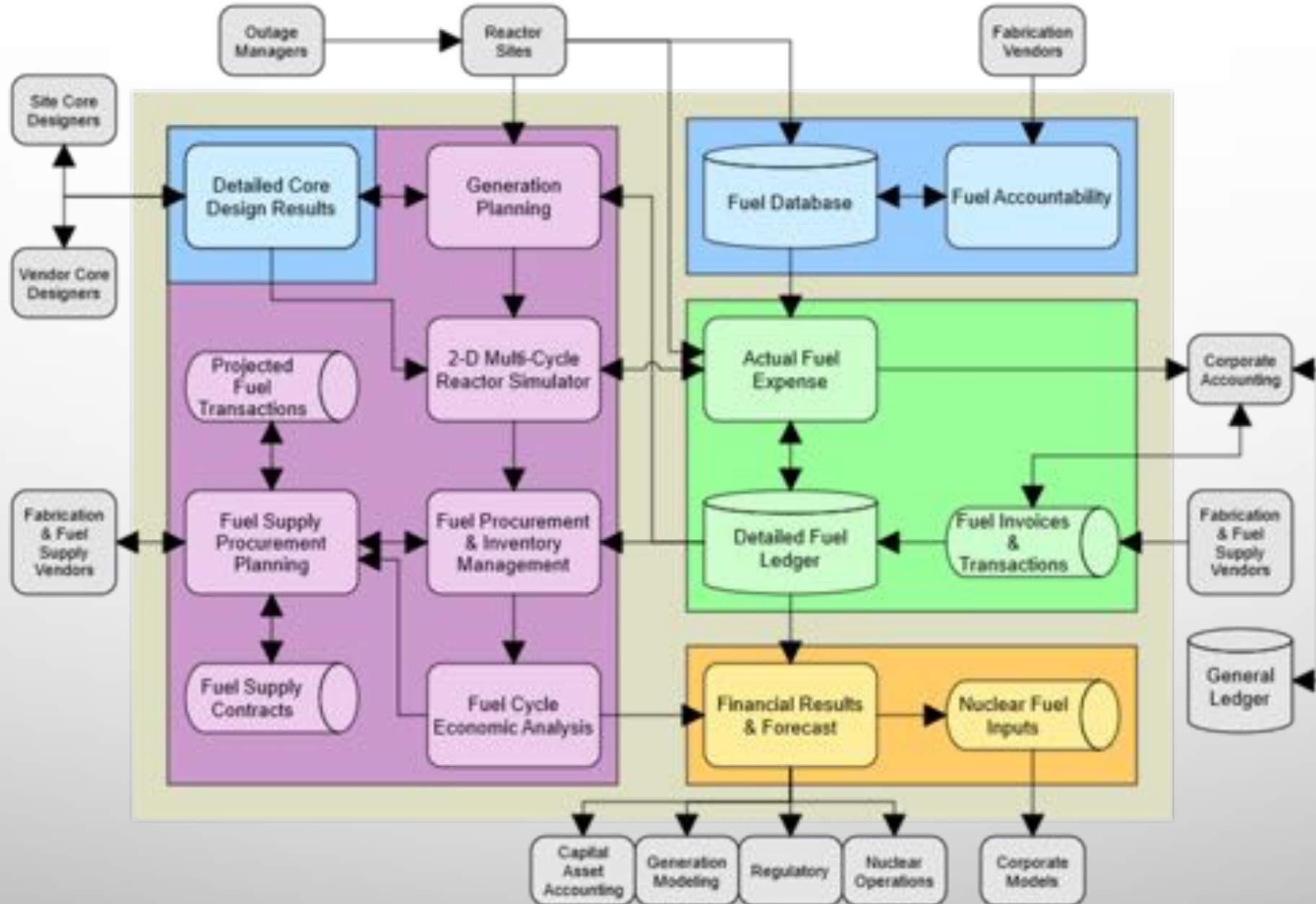
- Energy Requirements and Cycle Lengths
- Assembly Burnup Projections
- Monthly Fuel Expense Rates

Accounting

- Subsidiary Ledger for Nuclear Fuel Transactions and Commodity Balances
- Subsidiary Ledger for Actual Historic Generation and Fuel Expense
- Invoice Processing
- Summary Transactions for General Ledger

- Assembly Original Cost Calculation and Allocation
- Fuel Expense & Amortization
- Fully Expensed at Discharge

NUFMAP – INTEGRATED NUCLEAR FUEL MANAGEMENT & ACCOUNTING PROCESS



SURFNONLINE DESIGN

- SURF'N developed to enhance and extend NUFMAP package (**NUFMAP + SURF'N = SurfOnline**)
- Provide **Flexible Controlled Worldwide Access** to support a diverse set of user needs that are dispersed
- Provide **Rapid Response** to support fuel cycle management decisions and need for updated fuel information
- Ensure **Security of Sensitive Information** (no data or results need to reside on user workstation); all interactions with the system is encrypted
- Require **Minimum IT** support by User's organization
- Works on any workstation (desktop, laptop, tablet) through any modern internet browser
- Collaborative environment for workgroups
- Access to the latest codes and tools

SURFNONLINE SUPPORT

- Brian Huxtable
 - Huxtable Consulting LLC (est. 2017)
 - Email: brian.huxtable@hthassoc.com / brian@huxtableconsulting.com
 - Phone: 651-399-0832
 - Developer of SURF'N and maintainer of NUFMAP for over 20 years
- Dr. John A. Hughes
 - HTH Associates, Inc
 - Email: john.hughes@hthassoc.com
 - Phone: 651-485-6875
 - PhD Thesis: *Methods of Nuclear Fuel Management for Utilities* (1975)
 - Developer of GEM / NUFMAP and project lead for 40 years