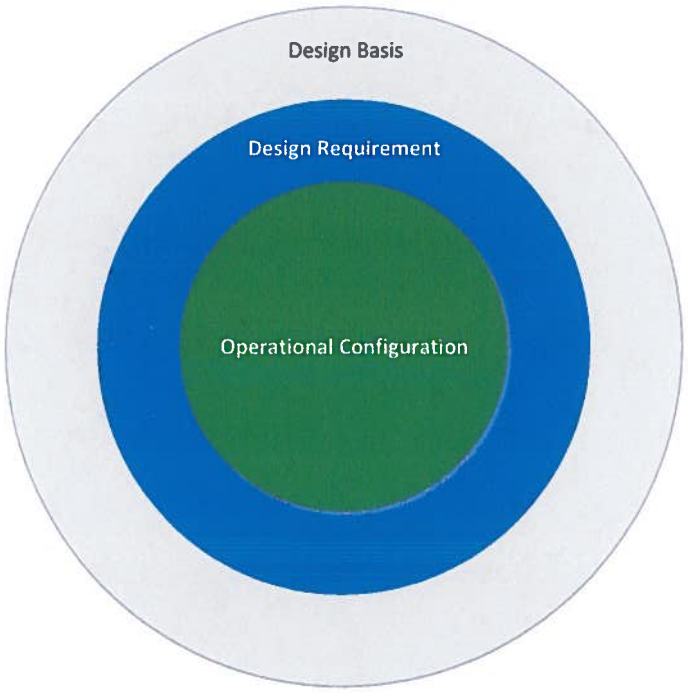
Potential areas for change in next revision of ANSI/NIRMA CM 1.0

1. <u>The 5 Functional areas</u> are contained in section 3.0 of Safety Report No. 65 should be added to aid CM practitioners at Operating Nuclear Plants. Owners of these areas (e.g. Design Engr Mgr owns #1 and #2, Plant Mgr owns #3,#4, &# 5) and the various procedures that implement them in a typical Utility).

1. Protect the Design Basis
2. Modify the Plant
3. Operate the Plant
4. Maintain the Plant
5. Test the Plant

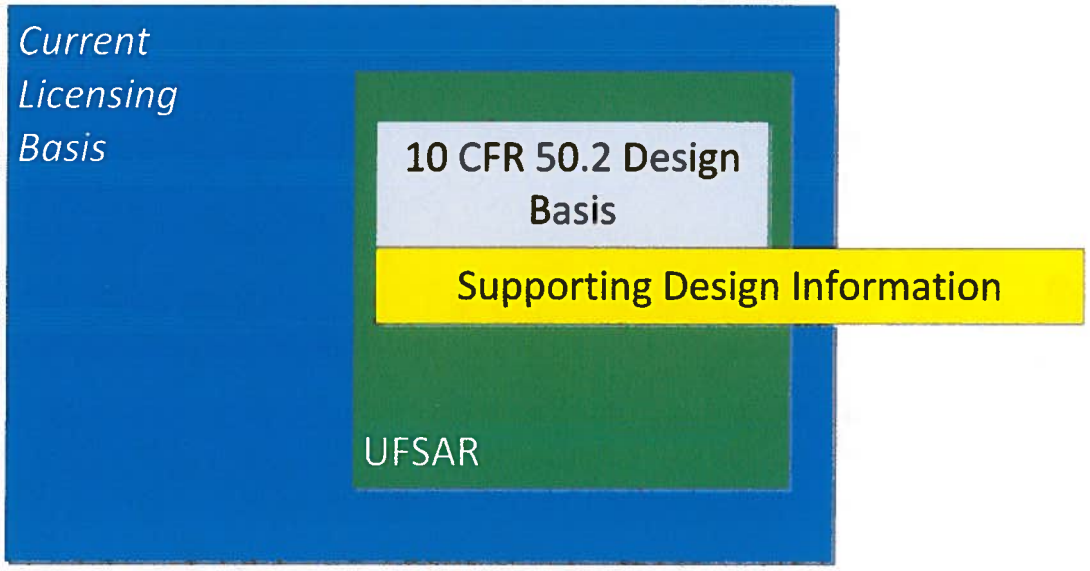
2. The Margin discussion should be expounded to explain that margin management is inextricably linked to accomplishing the CM Objective of maintaining equilibrium of the 3 ball model. This is explained in INPO AP 929 rev 1 App C "Well Managed Margins". It also reinforces Figure C1, "the bulls-eye model".



<u>Configuration Management Conformance within Design Basis</u>

3. The top ball "Design Requirements" could be renamed "Design/Licensing Basis Requirements". The top ball is referred to as "what is supposed to be there". NEI 97-04 rev 1 is a good source to help clarify the relationship between Design and Licensing Basis. Given that the principal design criteria (GDCs) come from Regulatory Requirements (10CFR50 App A) and the License Extension 10CFR54.3 defines the CLB, it is obvious that Design Requirements are based (derived from) in Regulatory requirements. Lack of understanding this relationship (Design and Licensing basis) is one of the main CM Equilibrium upsets challenging Operating Nuclear plants today. Maybe the upset is within the one ball (Design Requirements and how they reconcile with Licensing requirements) versus between the top ball and either of the other 2 balls (FCI and Physical plant). But to ignore the importance of Licensing Basis and its role in CM equilibrium is incomplete.

I think if the next revision included changes that address these 3 areas the document would be much more useful for CM Practitioners at all Operating Nuclear plants. The Venn Diagram of NEI 97-04 rev 1 kind of sums it all up. The term ***supporting design information*** superseded the previously used term ***Engineering design basis,*** and includes DBDs.



Relationship of 10 CFR 50.2 Design Bases and Supporting Design Information to the UFSAR and Licensing Bases

Margin and "who owns it?"

Can an SSC related to Tech Specs be Degraded but not OBDN?

Yes. Per NRC Inspection Manual 0326, section 03 Defined terms 03.04 Fully Qualified means it conforms to all aspects of the CLB including specific Codes, Standards, design criteria, safety analysis assumptions, specifications and licensing commitments. An SSC is considered "not fully qualified" i.e. degraded or non-conforming when it does not conform to all aspects of its CLB , including all applicable codes and standards, design criteria, safety analysis assumptions, specifications and licensing commitments. ***Non-conforming* is generally referring to elements of the CLB and therefore has Operability implications (e.g. OBDN).** An SSC can be *degraded* to non-CLB information without impacting Codes and Standards (or other CLB elements) and not impact Operability resulting in a CAP item for restoration. The measuring stick for Operability implications is whether or not the CLB is impacted by the loss of quality or functional capability identified due to the degradation.

The SSCs that Tech Specs require to be operable are designed and operated as described in the CLB, with design margins and Engineering margins of safety to ensure among other things , ***that loss of some quality does not result in immediate failure to meet a specified safety function***. The CLB includes commitments to specific codes and standards, design criteria and some regulations that also dictate margins. Many licensees add conservatism so that a partial loss of quality does not affect their commitment for design and operational margin. Loss of conservatism that is not credited in the CLB does not affect Operability or Functionality. ***Loss of Required Quality*** is a degraded condition. It is defined as a loss of margin to the extent that **required or necessary conservatism** has been removed.

Therefore, if it can be shown that the degradation or non-conformance in question is NOT credited in the CLB and/or was added by the licensee beyond the required CLB commitments (if any) then the SSC is fully Operable as **the loss was available to licensee for its use**. Restoration is controlled by CAP.

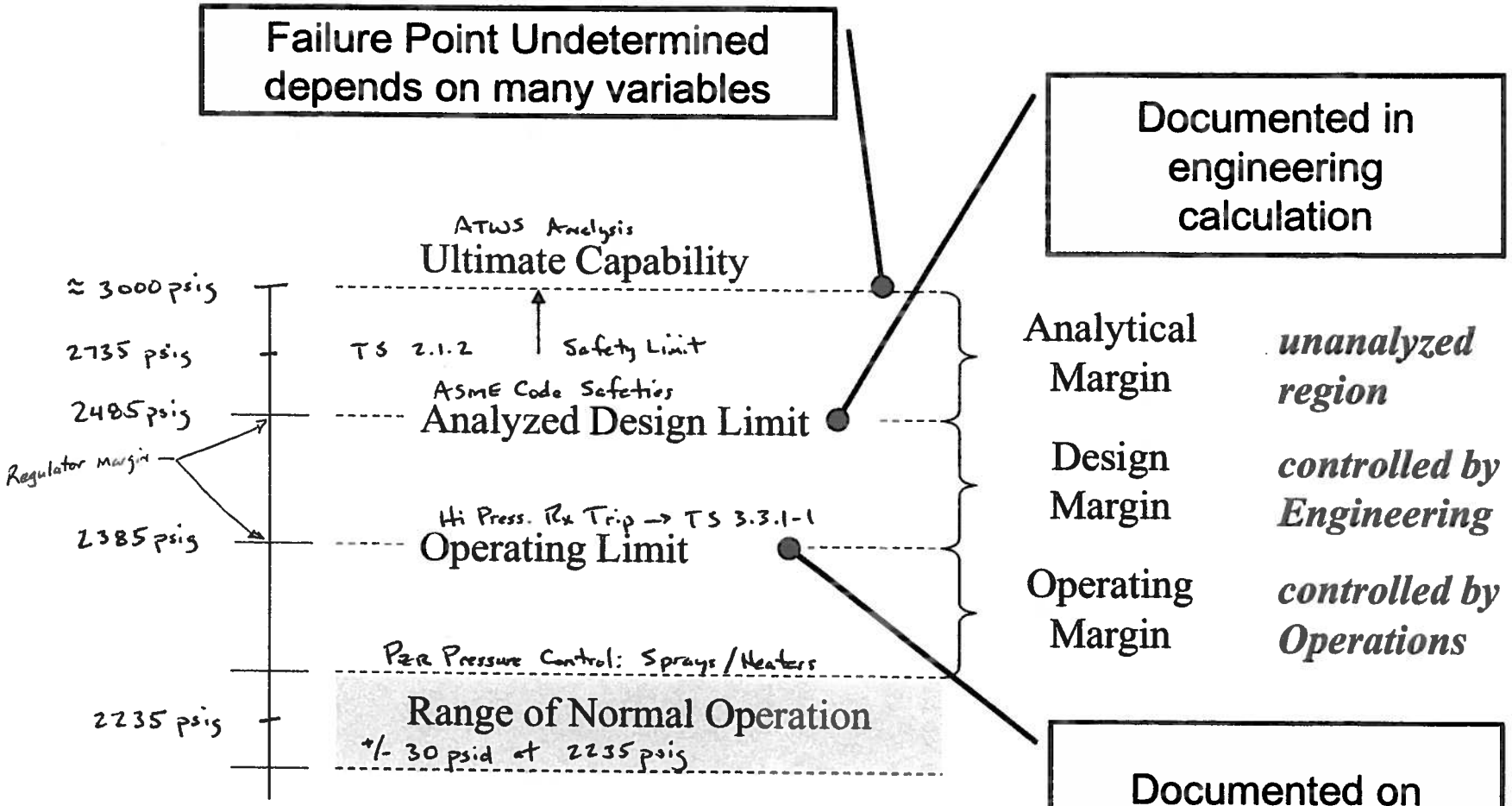
Per AD-OP-ALL-0105, rev 2, section 5.4.1(2): The term Degraded or Nonconforming Condition only has meaning relative to the CLB. It does not apply to losses of quality or functional capability that are not credited in the CLB nor does it apply to non-conformances outside the CLB. NRC Inspection manual - 0326, section 3.04.

Example: Unit 1 Pzr Level Noisy Channel 1: Further review could not find any aspect of CLB impacted by "noisy channel 1" possibly related to bent impulse tubing. Since the PZR level channel indications are currently within specified tolerances (+/- 3.5%) for the Mode surveillances and the impact of the downward spikes and oscillations do not adversely affect the safety function for a Rx trip on high pressurizer water level. Since "Loss of conservatism that is not credited in the CLB can't impact Operability" the item is degraded but not Non-Conforming to any CLB elements. Therefore, it is degraded and not OBDN, but still a CAP item. The slope is a design and installation recommendation but is not part of the CLB.

Example: NC Pressure

Design Pressure = 2485 psig
Normal operating = 2235 psig +/- 30 psid

Margins



Notes on Model

describes one parameter only; different parameters may be interrelated
direction may be positive or negative
doesn't represent all possible limits and setpoints
gaps not intended to represent relative size of margins – may be zero

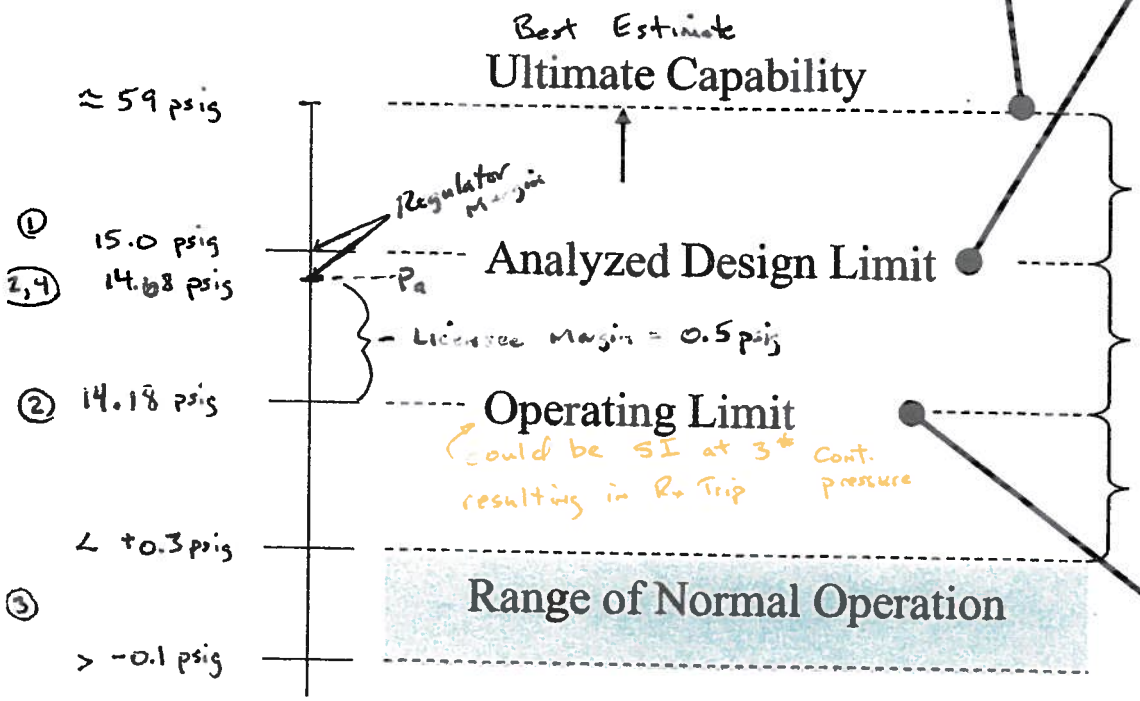
Example: Containment Pressure

Design Pressure = 15.0 psig
Normal operating = −0.1 → +0.3 psig

Margins

Failure Point Undetermined
depends on many variables

Documented in
engineering
calculation



Analytical Margin	*unanalyzed region*
Design Margin	*controlled by Engineering*
Operating Margin	*controlled by Operations*

Documented on
design documents

Notes on Model

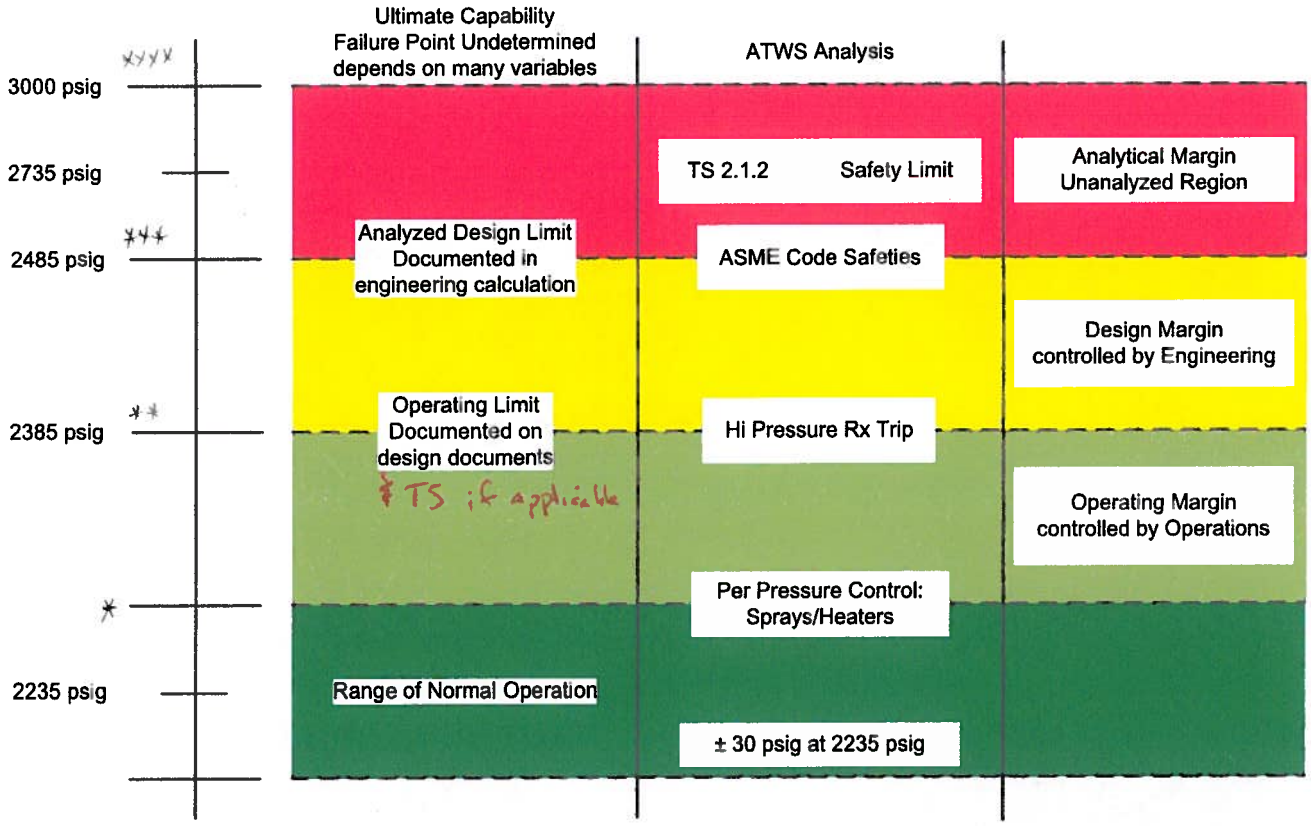
describes one parameter only; different parameters may be interrelated
direction may be positive or negative
doesn't represent all possible limits and setpoints
gaps not intended to represent relative size of margins – may be zero

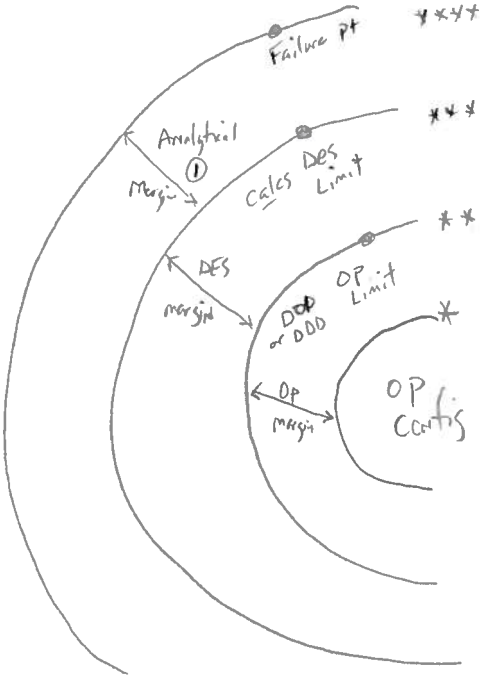
1 – UFSAR 6.2.1.1.2, Design Pressure
2 – UFSAR 6.2.1.1.3, Peak Accident Pressure (imposed on syst)
3 – Tech Spec 3.6.4, limits air mass
4 – Tech Spec Basis 3.6.1, Pa = Cont Leak Rate Test Pressure

Margin Management Model

Margins

Example: NC Pressure Design Pressure = 2485 psig Normal Operating = 2235 psig



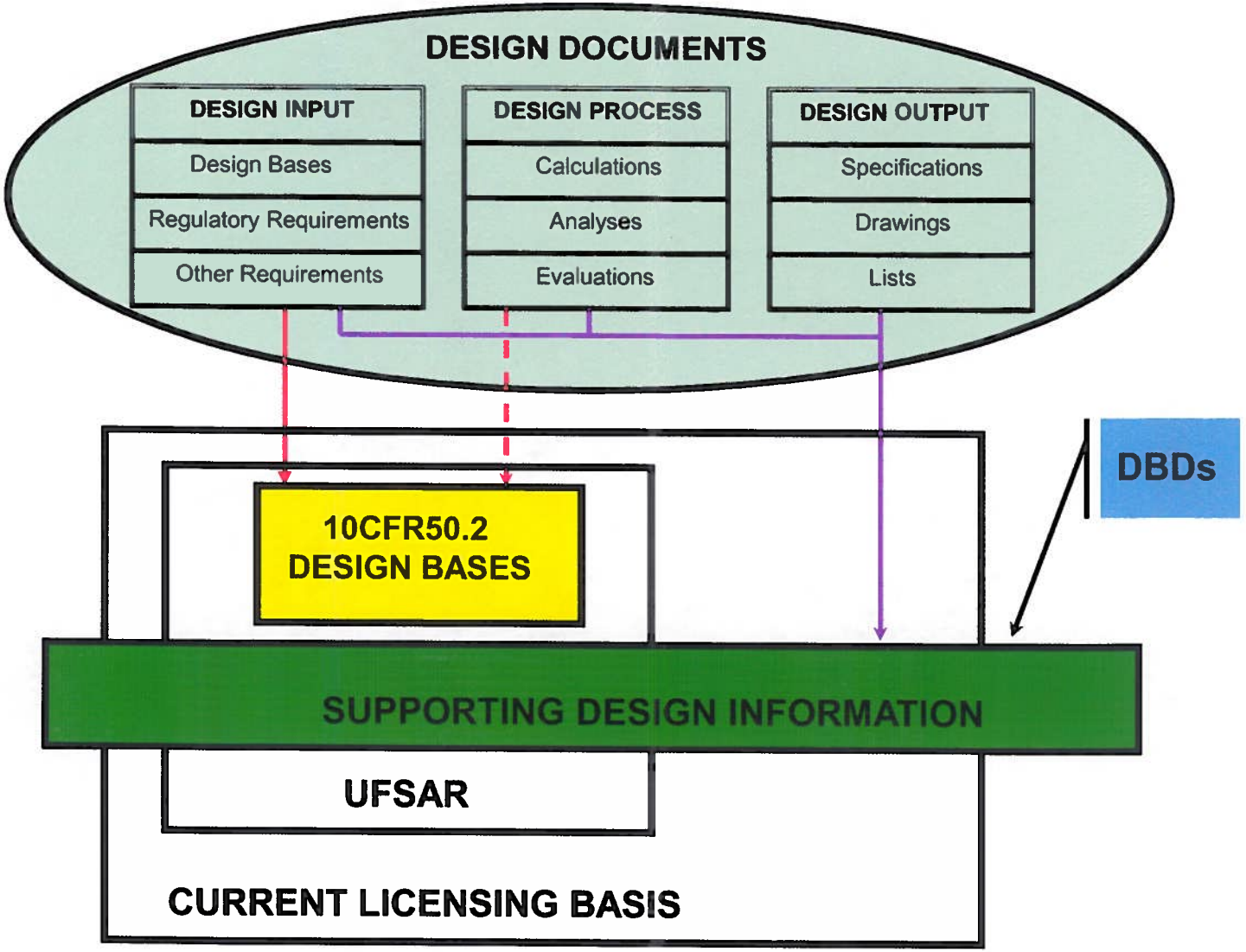


Key
Analytical Margin (Red)
Design Margin (Yellow)
Operating Margin (Green)
Range of Normal Oper. (Dark Green)

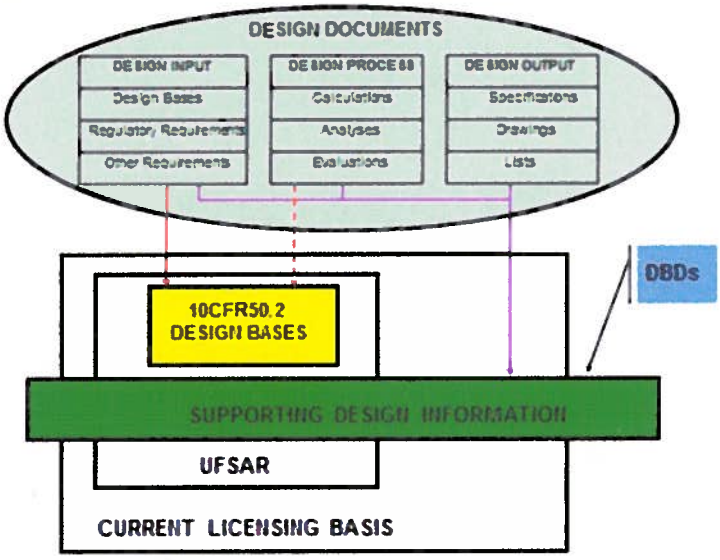
① Codes & Stds Define Analytical Margin

Note: For many Class 2 & 3 Systems (mech) the Design Pressure & Temp serve as both Operating Limits (dwgs) & Design Limits (calcs). This means a large Operating margin & "0" Design margin. Class 1 systems (NC & Cont press) have Tech Spec limits to guarantee "non-zero" Design Margin for Fission Product Barriers

Current Licensing Basis



Current Licensing Basis



3

- This diagram is not part of our training program but is contained in AD-EG-ALL-1106 ATT 2 and ATT 12. This diagram helps the reader understand the relationship of the 50.2 design basis and supporting design information to the CLB. It is based, in part, on diagrams from NEI 97-04 R1, "Design Bases Program Guidelines" and Licensing 101
- The 10CFR50.2 Design Bases -- that information which identifies the specific functions to be performed by a SSC and the specific values or ranges of values chosen for controlling parameters for design – are a subset of the CLB. These values may be derived from design inputs such as the GDC and/or design outputs such as drawings, specifications and other documents that define SSC technical requirements.
- The Supporting Design Information is the detailed information that provides a full understanding of how the 10CFR50.2 design bases are met. Supporting Design Information may or may not be a part of the CLB because ***our design doesn't relate to minimum compliance with the CLB.*** For example, we add conservatism so that a partial loss of conservatism does not affect the CLB. We also add features not required by the CLB to facilitate testing and maintenance and economies of operation.