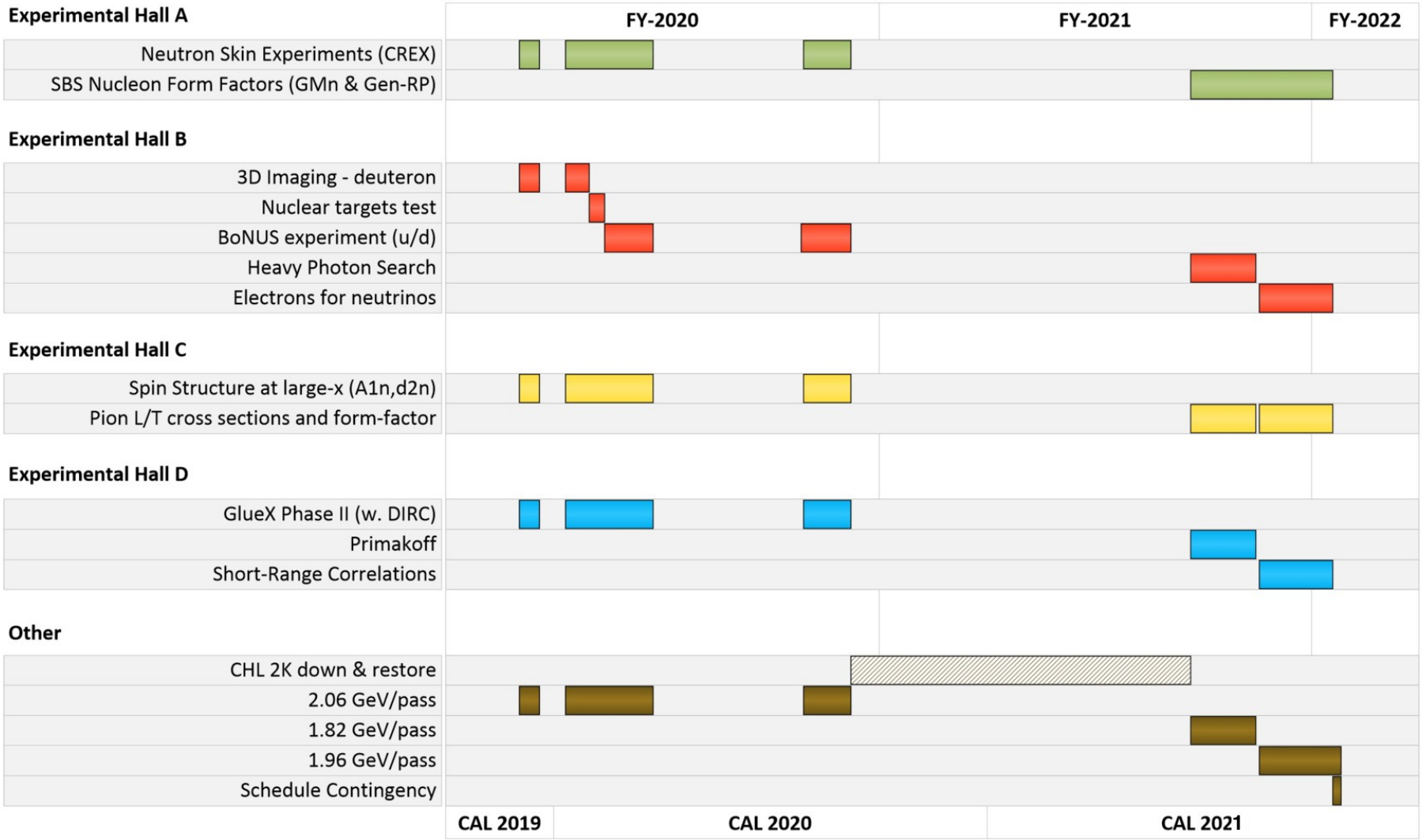
Experiment Scheduling

or ...

how the sausage gets made


Experimental Hall A
FY-2020
FY-2021
FY-2022
Neutron Skin Experiments (CREX)
SBS Nucleon Form Factors (GMn & Gen-RP)
Experimental Hall B
3D Imaging - deuteron
Nuclear targets test
BoNUS experiment (u/d)
Heavy Photon Search
Electrons for neutrinos
Experimental Hall C
Spin Structure at large-x (A1n,d2n)
Pion L/T cross sections and form-factor
Experimental Hall D
GlueX Phase II (w. DIRC)
Primakoff
Short-Range Correlations
Other
CHL 2K down & restore
2.06 GeV/pass
1.82 GeV/pass
1.96 GeV/pass
Schedule Contingency
CAL 2019
CAL 2020
CAL 2021

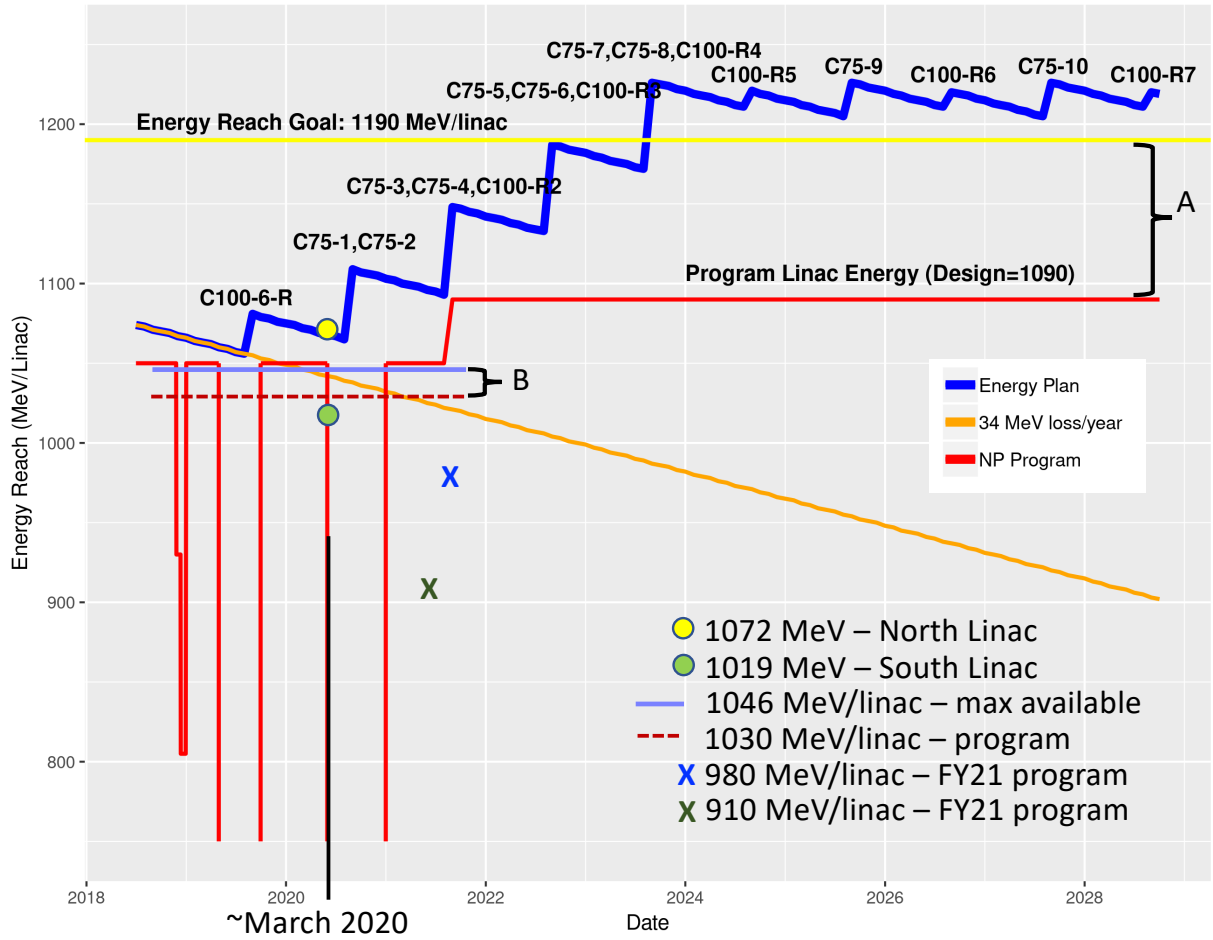
- Division (soft) long range plan – plan originates with the hall leaders. It determines how money (operations and capital equipment) is to be allocated to prepare equipment needed by future experiments.
- Science impact & timing
- Experiment readiness - can it be ready on time and make good use of allocated beam? (the purpose of the Experiment Readiness Reviews)
- Guidance from DOE Nuclear Physics on the number of operating weeks they can support - this by itself is an "iterative" process: every year, at the budget briefings lab management has with DOE NP, the number of operating weeks for the next couple of fiscal years together with highlights of possible programs and lab activities are discussed in the context of "funding scenarios" provided by DOE NP for those meetings.

- What can the machine support? - this originates with Accelerator & Engineering - e.g. energy, time required for repairs, installation of refurbished/new modules
- Facilities constraints - are there any time windows constraints from infrastructure work?
- The cloudy crystal ball - find a combination that maximizes the science output of the lab

- Number of operating weeks in FY21 ($\sim$15.5 weeks) - reduced compared to FY20 due to installation of new cold box, then further reduced because of,
  - delay due to COVID pause
  - slower rate of work due to social distancing requirements - affects installation of new cold box, refurbishment of modules and likely installation in the halls.
- Available energy gradients - affects how efficiently we run (*later*).
- Crystal ball - time/gradient available fit needs of L/T pion form-factors but not as well other experiments. In addition, expect availability of higher gradients in FY22 and longer running periods - attempting to run L/T exp. then will reduce hall multiplicity/physics. Select then a set of experiments compatible with the L/T separations that can get meaningful results on the available time window.

Energy plan is a bit old by now so, only approximate (e.g. we are not running at 2.1 GeV/pass as shown)

Gaps A & B determine how well the machine will run for experiments



- Experiment Scheduled Time (S) =
  Acceptable Beam Used (ABU)
  + Beam Available, but Not in Use (BANU)
  + Beam Not Available (BNA#1)
  + Beam Not Acceptable (BNA#2)
- For an experiment, the last two appear together as simply BNA – "no beam or it is unacceptable". Here Acceptable = "Hall is satisfied with beam quality".
- Experiment Scheduled Time = Published schedule $\times$ 6/7
  i.e. - 1 day a week for Accelerator development and it does not appear on above statistics

- ABU $\Rightarrow$ goal is 0.5 = scheduled PAC days
- Hall Availability = 1 – BANU
- Accelerator Reliability = 1 - BNA#1 $\equiv$ *there is beam in the machine*
- Acceptable Beam = 1 - BNA#2 $\equiv$ *hall satisfied with beam quality*

Availability (%)

	FY18		FY19 (Acc reliability = 81.3%)			FY20	
	Hall	ABU	Hall	Acceptable Beam	ABU	Hall	ABU
A	95	50	87	79	47	94	39
B	92	43	93	77	51	96	44
C	92	39	96	79	56	90	42
D	97	48	98	80	59	95	52
Physics weeks	15.7			30.1		13.1 (+6 remain)	

The source of frustration on some talks: Acc. Reliability is a DOE metric, Acceptable Beam is not, *but it contributes about the same to the running efficiency of an experiment (ABU)*