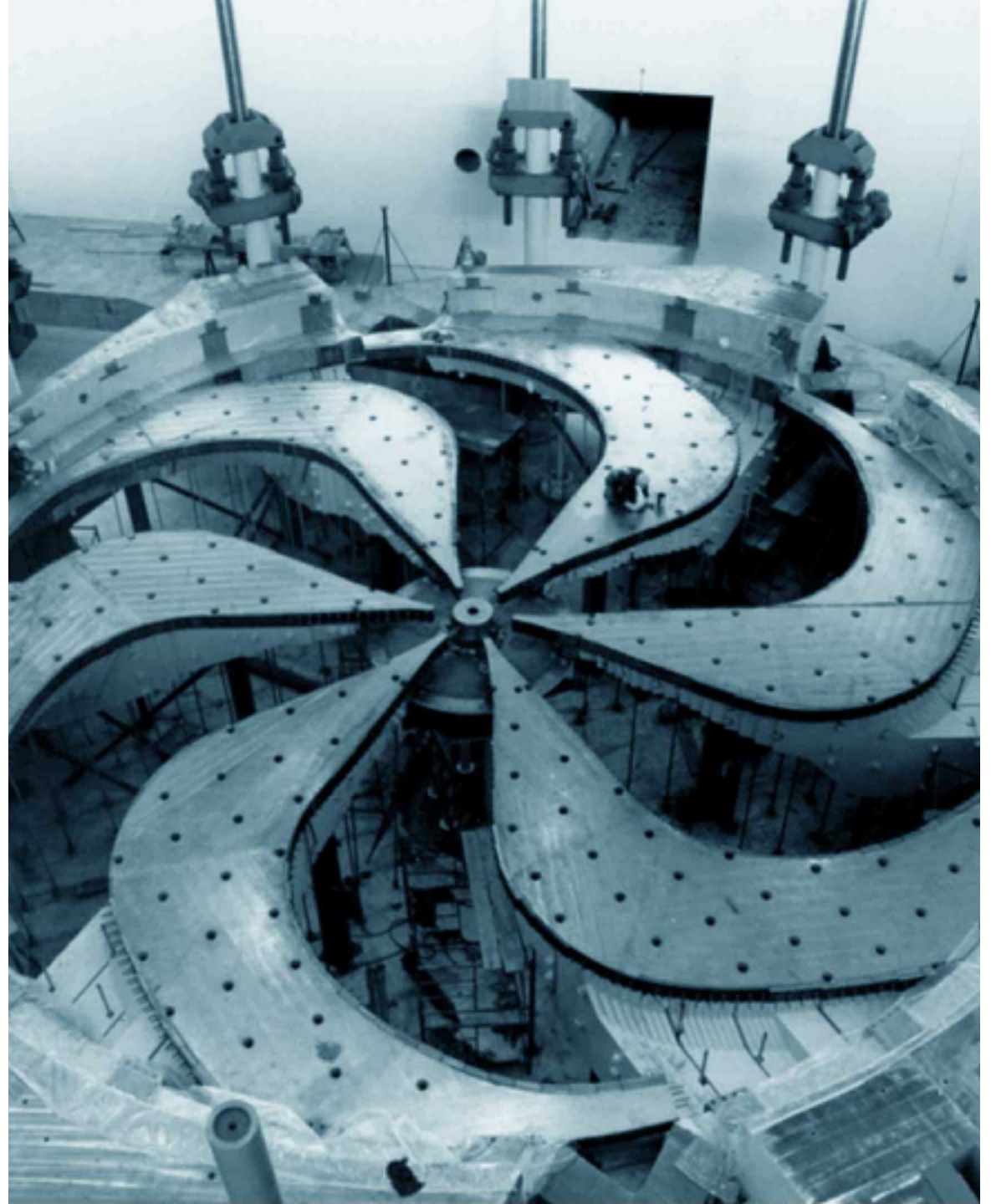


# nEDM CDR writing strategy

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TUCAN collaboration meeting August 2018

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# nEDM Conceptual Design Report (CDR)

- The TUCAN collaboration now needs to move from R&D activities to actually start building nEDM equipment
- Once the source is operational, we need to have some spectrometer operational (ideally)
- Thus we can learn to operate it – changes and upgrades can still be done later AND will then be better motivated and understood, based on real experience with OUR setup
- CDR is a deliverable for the CFI project and TRIUMF gate reviews, and precursor to technical design
- Overleaf link to skeleton w/ reading rights (for editing rights please contact me directly):  
<https://www.overleaf.com/read/ythpdxgtdzkq>



# CONCEPTUAL DESIGN REPORT FOR THE NEXT GENERATION NEDM SPECTROMETER AT TRIUMF

THE TUCAN COLLABORATION – AUGUST 9, 2018

## Contents

<b>1</b>	<b>Top level requirements: Statistics and Systematics down to <math>10^{-27}</math> ecm; cascades down into requirements for all subsystems, executive summary &amp; charge, level of detail of CDR (BF) (Rev: )</b>	<b>3</b>
1.1	Statistical Sensitivity . . . . .	3
1.2	Systematic Sensitivity . . . . .	3
<b>2</b>	<b>Superconducting Magnet, spin flipper SF0?, guiding fields? (KH? JWM will confirm) (Rev:)</b>	<b>9</b>
<b>3</b>	<b>UCN handling (RT portion outside of source?), switch? (RMam RP) (Rev:)</b>	<b>10</b>
<b>4</b>	<b>SSA and detectors (BJ, PG subsystem) (Rev: )</b>	<b>11</b>
<b>5</b>	<b>nEDM precession cell, HV, vacuum (RP FK) (Rev:)</b>	<b>12</b>
5.1	Requirements . . . . .	12
<b>6</b>	<b>Magnetically shielded room (RMam) (Rev: )</b>	<b>15</b>
<b>7</b>	<b>Inner Coil systems: B0 B1 shim/trim (CB) (Rev: )</b>	<b>16</b>
<b>8</b>	<b>Inner Magnetometers, Squid, inner mapper (used in analysis? BF) (JWM) (Rev: )</b>	<b>17</b>
<b>9</b>	<b>Comagnetometers (TM)</b>	<b>18</b>
<b>10</b>	<b>Ambient Magnetic Field Control (BF)</b>	<b>19</b>
<b>11</b>	<b>nEDM services: thermal &amp; vibration stabilization, etc. (CAD) (Rev: )</b>	<b>20</b>
<b>12</b>	<b>DAQ &amp; control: fast and slow control, Data structure, data/shift taking(?), and analysis strategy, automation... (TL ?? &amp; KM ?? ) (Rev:)</b>	<b>21</b>
<b>13</b>	<b>Interfaces (RP BF) (Rev: )</b>	<b>22</b>
<b>14</b>	<b>Satelite facilities: Xe EDM and guide coating facility (TM RMam) (Rev: )</b>	<b>23</b>
<b>15</b>	<b>Appendices</b>	<b>24</b>

# Requirements of subsystems and Interfaces

- It all cascades down from our sensitivity goal of  $10^{-27}$  ecm
- Pleased to see requirements lists getting started... but still lots of work to be done
- “Interfaces responsible” should be identified, ideally we hire/engage an engineer that can help us with mechanical and systems engineering aspects
- Ownership/champions/subsystem managers have mostly been assigned, but resource loading has to be taken more seriously – ie someone actually needs to do some work.

## nEDM CDR kick off meeting in June

1. Small(er) meeting with some subsystem managers and people involved in nEDM R&D and design work
2. Started discussing requirements – nailing those down is the highest priority right now!
3. Unfortunately not much progress yet (other than nEDM systematics and precession cell)...
4. Our PM Chris G. started prompting subsystem owner for requirements documents; these are being followed up within an action tracker

# CDR status:

- We failed our goal from kick off meeting:  
fill requirements where known, or determine questions to be answered such that requirements can be defined  
(goal date was this collaboration meeting...)
- Currently CDR completion date is December
- Many subsystem owners teach starting September, and we are preparing our fall run UCN beamtime

# CDR writing strategy:

- General strategy: work analogous to New Source CDR by creating skeleton and assigning responsible people for (sub)sections
- How can we ensure progress?
- Chris G. will be monitoring the progress of requirements documents
- Weekly nEDM meeting should be used to monitor progress, in a similar way than in the weekly New Source meeting
  - > More 'owners' would have to call in to be effective, shall we adjust the time slot of the meeting?

- We need YOUR buy in and work force to make it happen!



Thank you  
Merci

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