# Input files for VaNDaL and QA


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- **Introduction**
- **LANL MCNP inputs**
- **The way forward**
- **Using VaNDaL input files**

# MCNP input files available at LANL

## The Skip Kahler suite

- A total of more than 1000 ICSBEP benchmarks
- No QA procedure at all, although Skip used a consistent procedure to make all inputs

## The WHISPER suite

- Originally based on the Skip Kahler suite
- A QA procedure is in place because these are used in criticality safety

## The Nuclear Data Team suite

- Basically the Skip Kahler suite, with some PARTISN and SENSMG inputs
- No QA procedure at all

## The Steven Van der Marck suite

- Taken from the ICSBEP benchmark reports
- As far as I know, no QA procedure at all

# What we want to do

## Step 1 : consolidate everything into a single suite

- Verify inputs against each other if there is overlap
- Develop tools to start doing this automatically
- Make it available on the OECD/NEA Gitlab site and probably make it public later

## Step 2 : compare overlapping inputs with other code inputs

- The intercomparison between LANL-LLNL-IRSN is a first step

## Step 3 : start creating VaNDaL inputs

- Codes involved: MORET, COG, MCNP (we hope)
- Create a common QA document associated with the inputs and apply it

# Comparing and validating inputs

## There are basic data to validate inputs against each other

- This can be automated as most codes provide some or all data

## Material compositions

- Nuclides present in the material
- Densities of the material (atom density and gram density)
- The actual compositions (atom fraction and weight fraction)
- Material mass and volume

## Any other ideas?

# Material information extracted from MCNP output

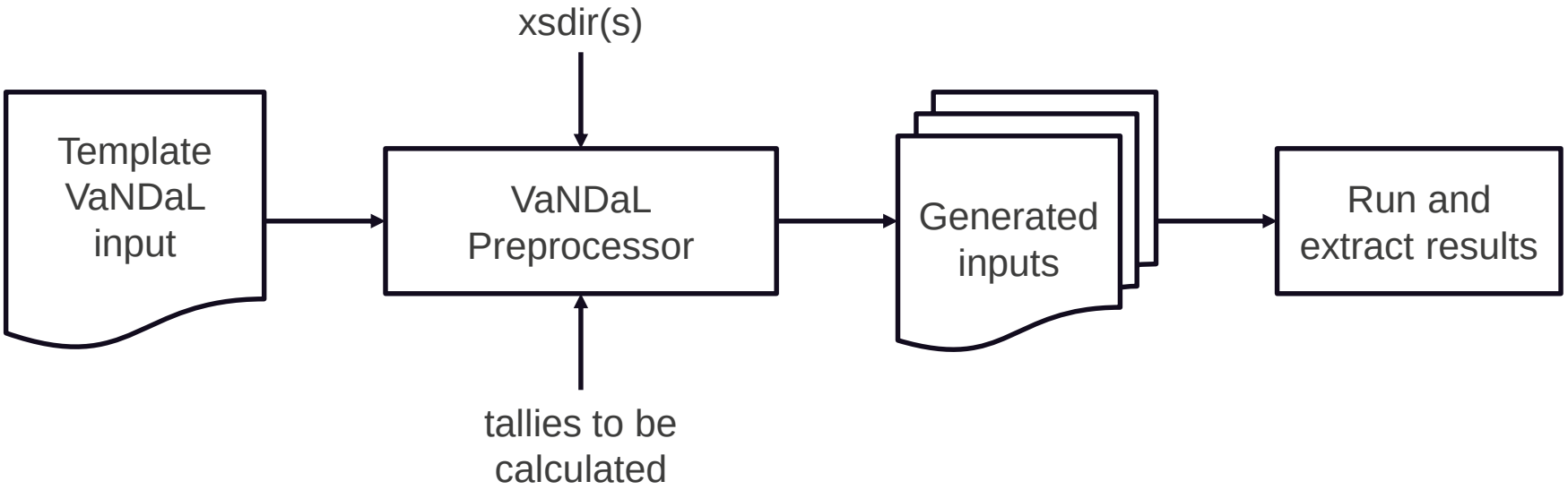
```
# every material/cell has this information which can be used for verification

{ 'name' : 'm1-c1',
  'nuclides' : [ '92234', '92235', '92238' ],
  'atomDensity' : 1.87402E+01,
  'gramDensity' : 4.79842E-02,
  'mass' : 5.24205E+04,
  'volume' : 2.79722E+03,
  'weightPercent' : { '92234' : 1.01999E-02,
                      '92235' : 9.37100E-01,
                      '92238' : 5.27004E-02 },
  'atomPercent' : { '92234' : 1.02500E-02,
                    '92235' : 9.37683E-01,
                    '92238' : 5.20671E-02 } }
```

# VaNDaL input files

## Template input files for each code

- Benchmark geometry
- Detailed benchmark material compositions without library information (isotopic only)
- No tallies to calculate results
- Template inputs are consistent between codes



# Feedback to ICSBEP and DICE

## A python interface to DICE would be nice …

- Useful for doing the automated validation of inputs
  - We still need the tables from the pdfs ☹ … but we only need to do this once ☺
  - Once the materials are verified and merged by zones, this could be used as an import into DICE