FUKUSHIMA MELTDOWN REACTOR: BURN EVERYTHING

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ABSTRACT

Elainie Lillios, Advisor

Fukushima Meltdown Reactor: Burn Everything is a six-movement, fifteen-minute multimedia work composed for performance by the multimedia trio, Netmoiré, whose performing forces include saxophone, two live electronics performers, and live visuals. The piece’s music, visuals, and performance art elements were inspired by the March 2011 Fukushima nuclear reactor disaster.

*Fukushima Meltdown Reactor* takes the audience on a dramatic journey through the process of a nuclear reactor meltdown from an omniscient viewpoint, with performers cast into character roles. The saxophonist represents Uranium-235, which is the isotope used in nuclear fission reactors. Since the two electronics performers are positioned in front of arrays of knobs, buttons, and screens, they act as the power plant operators.

Technology serves as a central focus in *Fukushima Meltdown Reactor*. The saxophonist is amplified and one of the electronics performers is primarily responsible for processing and manipulating the instrument’s sounds using the Ableton Live signal-processing environment. The other electronics performer cues fixed media sounds, operates software instruments created in Cycling ’74’s Max/MSP audio programming language, and triggers video clips.

To expand the piece’s concept into the visual realm, individual, concept driven animations serve as a digital version of a stage set. Animation source materials include
hyperboloid shapes, the Bohr model of the atom, and news coverage clips from various nuclear disasters.
This piece is dedicated to the Japanese people who were, and continue to be affected by the Fukushima Daiichi nuclear power plant disaster. While the piece is not a direct telling of their story, I hope it will raise awareness about the disaster, and the irresponsible management of a potentially viable, and safe form of energy.
ACKNOWLEDGMENTS

I would like to thank Elainie Lillios for her guidance in bringing this piece to life, and her overall open mindedness to my ideas. I would also like to thank Kurt Doles, and the rest of the MACCM committee for providing me with generous travel funding to perform at events all over the country, and outside of it. These experiences gave me vital inspiration for this piece. Lastly, I want to thank the other two members of Netmoiré — Jason Charney, and Nick Zoulek, who have constantly pushed me to be a better musician, and helped to creatively realize this piece throughout its later stages of development.
Fukushima Meltdown Reactor: Burn Everything

for alto saxophone (Uranium-235),
two computer musicians (Operators 1 and 2),
electronic sounds, and video

Equipment
- 3 laptop computers
- 2 MIDI controllers (Akai APC40 or similar)
- 2 audio interfaces
  - both with stereo outputs
  - 1 with mono input
- 1 mixing board with at least 4 inputs
- 1 cardioid clip-on microphone (for saxophone)
- 2 medium sized studio monitor speakers
- Stereo house speaker system
- 1 projection screen
- 1 projector
- Cycling 74’s Max/MSP 6.1 (http://cycling74.com/downloads)
- Ableton Live trial version or higher (https://www.ableton.com/en/trial/)
- VLC Player (http://videolan.org)

Technical Setup
- This work includes a digital performance environment that utilizes Ableton Live (9.1.6 or newer) and Cycling ’74’s MaxMSP 6.1 Application or Runtime. To obtain the performance files, contact the composer at jcpsimmons@gmail.com
- Sounds, and effect manipulation are to be controlled via the performers’ MIDI controller of choice. The controller should have a similar layout to the Akai APC40.
- In addition to the two computer musicians, a third computer must be used for projecting looping animations/videos. The most reliable software for looping animation/video playback is the free VLC Player, which can be found at videolan.org
Stage Setup
Projection Screen (Vertical)

Technical Setup

Operator 1 laptop
Audio interface
Left Right

Operator 2 laptop
Audio interface with mono input
Left Right

Saxophone clip-on microphone

To stereo house speaker system
All audio Left
All audio Right

To medium sized studio monitors
All audio Left
All audio Right

Mixer
**Movement 1**

**Fukushima Meltdown Reactor: Burn Everything**

for Netmoiré

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**Operator 1:**
From time 0:00, begin by playing the lowest pitched samples. As you add higher partials to the soundmass, gradually introduce reverb and resonant filters.

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**Operator 2:**
From time 0:10, begin by playing the highest pitched samples. As you add lower partials to the soundmass, gradually introduce reverb and resonant filters.

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**Uranium-235**
From time 0:00, improvise over each of the provided pitch collections for ~45" in order from top to bottom. Begin with long tones and progress to ascending stepwise gestures and arpeggios.

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**Operator 1:** Tacet until 2:50, then begin to fade in Alarm 1.

**Operator 2:** Add 8vb harmonization and gentle distortion to U-235.

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**Reversible Reaction:**
Alternate gestures for 1:00 with up to 2" silence in between.

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**U-235**

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**0:00-2:00**

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**2:00-3:00**

**Reactor Online**

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**one full breath**

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Movement 3

STAGE

AUDIENCE

Operator 1:

Begin wind and tornado siren sounds simultaneously. Increase pitch deviation of the siren over the course of two minutes. Sound will automatically and continuously pan around the audience.

Operator 2:

Tacet

Uranium-235:

On the mouthpiece and neck alone, create a gradually glissing tone that mimics the speed and timbre of Operator 1. Over the course of two minutes, complete one entire revolution around the performance space perimeter, using only the the main aisles.
Increase Neutron Multiplication Rate:
Play notes one and two, then one through three, then one through four.
Continue in this manner until looping the whole gesture.

Fire Triangle:
Alternate between gestures and text, leaving 0-5 seconds between outbursts.

U-235:
Play the gestures indicated above the curve line at the times designated at the bottom of the graph.

Operator 1:
Begin drum samples at the specified times below. Increase global tempo and overdrive according to the charted curve.

Operator 2:
Gradually increase U-235 overdrive and distortion levels according to the curve below.

Operator 1:
Increase distortion according to curve.

I went back to sleep because I was too scared. I heard on the radio that the nuclear power plant in Sweden had a high reading from power plant radiation has been heard, uh...

No one was sure that they had been heard, uh...

I heard on the radio that the nuclear power plant in Sweden had a high reading from power plant radiation has been heard, uh...

No one was sure that they had been heard, uh...

I went back to sleep because I was too scared. I heard on the radio that the nuclear power plant in Sweden had a high reading from power plant radiation has been heard, uh...

No one was sure that they had been heard, uh...

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No one was sure that they had been heard, uh...

I went back to sleep because I was too scared. I heard on the radio that the nuclear power plant in Sweden had a high reading from power plant radiation has been heard, uh...

No one was sure that they had been heard, uh...
Gradually fade out the residual delay by decreasing Operator 2’s master fader.

Key signature carries through movement. Gestures are spatially notated to sync with the time ruler at the top of the page.

Add 8vb harmonization, 5000 ms low pass filter delay, and reverb to U-235.

Slowly walk to the rear of the stage. Stand motionless in front of the projection screen until the end of the piece.

Fade in drone.

Gradually fade out the residual delay by decreasing Operator 2’s master fader.