Cutting Process Update Method to Simulate the Nuclear Facility Decommission

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1. Introduction

In the previous study, we have developed the cutting simulation software framework to simulate the nuclear facility decommission [1, 2]. However the software is difficult to update the cutting process due to lack of remaining information of related device model and target model of the cutting, after creating the process. To solve the problem, in this study, we proposed the cutting process update method.

2. Cutting process update method

2.1 Data structures

In the cutting process modeling procedure of existing cutting simulation software, a user selects the models of the cutting and carrier devices from the resource list and selects the cut target product in the product list as input of a cutting process creation. The selected cutting device model has a pre-defined cutter profile and cutting depth. And the user creates moving path using the carrier device. Based on the created moving path and cutter profile, the cutting volume is created to cut the target model.

The cutting process is able to store information about the movement of the carrier and cutter device and post visual process which hide target product and show cut result product, as shown in Fig. 1. However, the cutting volume is no longer available after cutting

procedure is finished. Therefore to update the specific cutting process, user needs to recreate the cutting volume and the cutting process manually.

To automate the procedures we add a new data structure as a sub element of the cutting process item as shown in Fig. 1. Using the data structure we record the cutting device and carrier device, target product and cutting option to recreate the cutting volume.
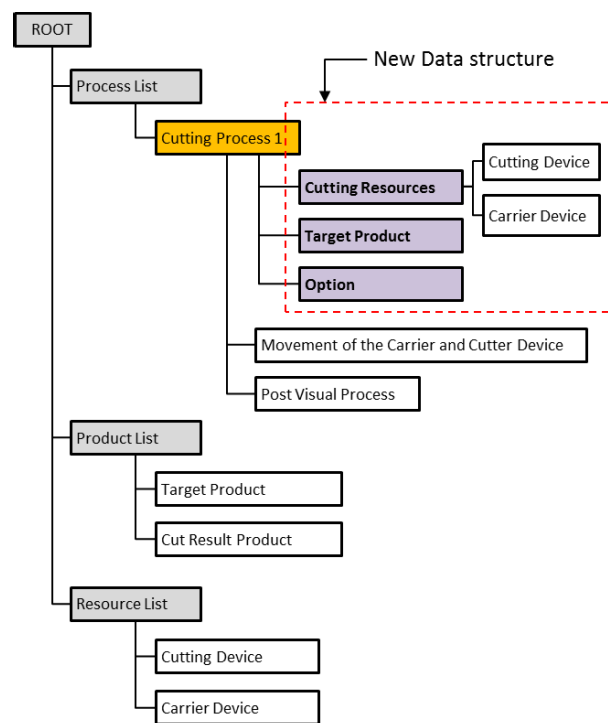

Fig. 1. Data Structure.

2.2 Cutting process update

In case of cutting resources has changed or the target product and cutting option has changed, the cutting process should be updated. We duplicate the

cutting process which will be updated, and recreate cutting volume using cutting resources and create cutting process by cutting the target product based on stored data in the proposed new data structure. And finally delete the original cutting process and create process flow to new cutting process to be able to simulate using the updated cutting process.

3. Conclusion

In this study, we proposed the cutting process update method in the cutting process simulation software. We define the new data structure to enable the cutting process update feature. And we describe the general cutting process update scenario. This method helps reducing the process modeling time when modeling the cutting process of the nuclear facility decommission.

REFERENCES

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