

## Consideration on the 1 Ton Bucket Elevator Installed Under Water of Pool in IMEF

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### 1. Introduction

The bucket elevator which can transfer examination capsule or fuel from pool to hot cell is installed under water of pool (3x6x10 m) in IMEF. A allowable load is 1 ton and the dimension of bucket is 25x25x150 cm. The upper and lower sides motion of bucket have about 63 degrees inclined duties with a chain driving system. A specialized made chain catches a rug of bucket with a roller sliding way between right and left guide rails which are fixed at inner of a square tube and moves to an upper and lower sides and it is made so that it is operated by sprocket wheel installed in a hot cell working table below. Sprocket wheel is executed to two steps of driving shaft by reduction geared motor installed at right outside of M1 hot cell. As for the starting operation, it is executed by push an operation button on a operating panel located at front of M1 hot cell [2].

### 2. A design of a device

The five parts of 1 ton bucket elevator are as follows[1].

- 1) Rectangular Tube : L 6,150 m x W 2,46 m x H 0.5 m (ref. figure 1)
- 2) Guide Rail : sus304L
- 3) Chain : Breaking strength : 8000 kg.
- 4) Bucket capacity : 25 x 25 x 150 cm
- 5) Driving Unit : Motor - 2.2 kw(ref. figure 2)

#### 2.1 Technical system requirements of each device

1. Codes & Quality Standards, materials of the rectangular tube
2. A complete design description of each device

- Rectangular Tube
  - Thickness of sus304L : 4 t
- Guide rail

- A straight line is connected by 6 bracket

- Stainless roller chain

- Standard : RF450-S
- Diameter & pitch : 22 x 101.6 mm
- NO. of Chain : N = 2
- Breaking strength : 8,000 kg
- Sprocket efficiency of chain : 95 %

- Bucket

- Rated load : Q = 1,000 kg
- The weight of a bucket oneself : Q1 = 180 kg
- Mobile speed : V = 5 m/min
- Starting motor & reducer
- Power : 2.2 kw
- Reducing ratio : 1/377

#### 2.2 Production of a device

1. Production check : material check, a parts check, demension and a processing check, a welding check

2. NDT check : A leak test, assembly check, a material surface check

#### 2.3 Installation of a device

1. Installation to have been based on installation procedure : field delivery and an installation drawing

2. An installation check : measurement equipment, an installation check and a report

3. A trial run check : in an examination procedure, measurement equipment, check record, imbal-ance item process

#### 2.4 A synthesis trial run of a device

### 3. Conclusion

In this paper describes technical specification about a device of a similar bucket elevator which I built it from now on, and to be operated. The bucket elevator system of IMEF is operating very well in accordance with design, manufacture, and installation so the described technical specification requirements will be applied to a similar bucket elevator transferring system. The 1ton bucket elevator to use seems to be a figure 3.

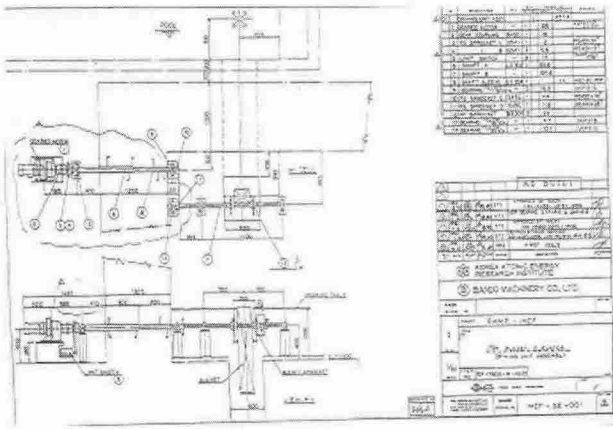


Figure 1. Driving part of 1 ton bucket elevator



Figure 2. A form to mount a capsule on bucket of 1ton

capacity Bucket elevator

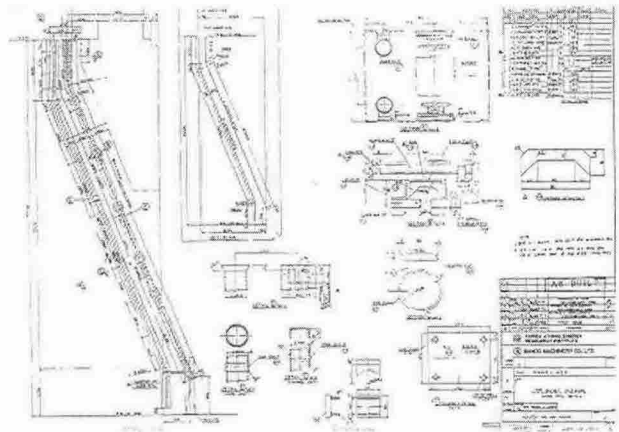


Figure 3. Rectangular tube

### REFERENCES

- [1] BANDO machinery co. ltd., "End of Manufacture Report for Rectangular Tube for Bucket Elevator", 1992.
- [2] Ung Sup. Song, "A driving of 1ton bucket elevator installed in an irradiated material examination facility and a technology about complement maintenance", KAERI/TR-1301/1999.