APPLICATION OF DRAWING DONE IN AUTOCAD FOR THE PRODUCTION OF THE PARTS ON MACHINE WATER JET

Snežana J. Radonjić, PhD. Full professor
Anđelija M. Mitrović, Assistant
Faculty for Technical Siences
**Svetog Save 65, 32000 Čačak**
Serbia

ABSTRACT
In this work we explained the way AutoCAD drawing should be prepared for use in WRYKRYS program for PTV Water jet (2D) through an example. The machine described here is being used in company „SLOVAS" in Čačak (see Picture 1).
Keywords: AutoCAD, WRYKRYS, Water jet

1. INTRODUCTION

Water jet is a CNC machine used for cutting various materials within a wide range of material thickness. Cutting with the machine is carried out using water under 4180 Bar pressure and adding boulder sand, granulated to different degrees, as an abrasive. This type of cutting is two dimensional, while some types of machine can perform angle cutting, that is chamfering, as well as round pipe and square pipe cutting. Some of materials that can be cut on Water jet machine are: metals (aluminium, steel, stainless steel, copper,...), glass, ceramic, marble, rubber, plastics, leather, sponge, etc. Cutting problems occur only when cutting exceptionally adamant materials e.g. some types of ceramic used for making prochrome grinding knives, or brittle materials like hardened glass, some types of artificial marbel, etc.
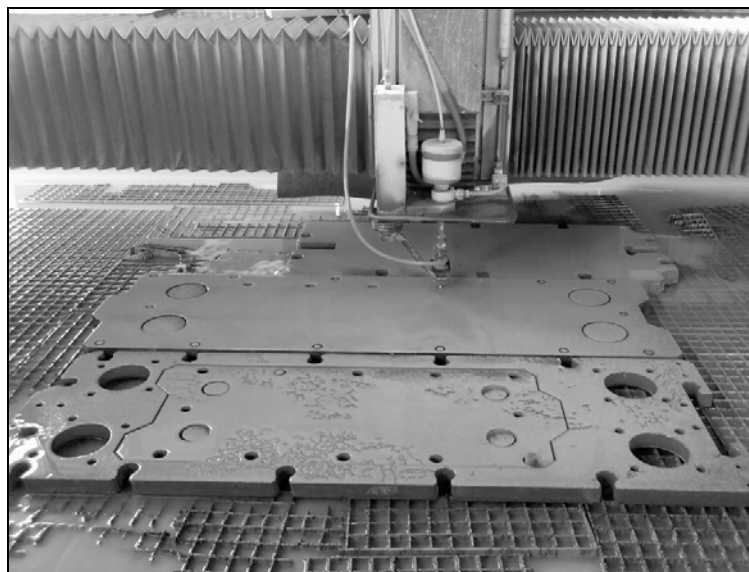

Picture 1. PTV Water jet

2. AUTOCAD APPLICATION OF A DRAWING FOR PURPOSE OF PARTS PRODUCTION ON WATER JET MACHINE

The most common type of drawings to be obtained when working with Water jet machine is the drawing done in AutoCAD. In picture 2. a drawing of a cutter done in AutoCAD to be adapted and used for working on Water jet is shown.

The basic preparations and adjustments of AutoCAD programme should be made before starting with AutoCAD application of a drawing. The drawing precision should be to within microns, this being precision tolerance the machine achieves in positioning of tools (it is important to notice that this is not the precision tolerance for parts production, the latter being up to 0.2 mm depending on materials and the quality of the assigned cutting). In case that the adjustment has not been done the lines would not appear as cojoint and discountinuations in the outline will appear in WRYKRYS.
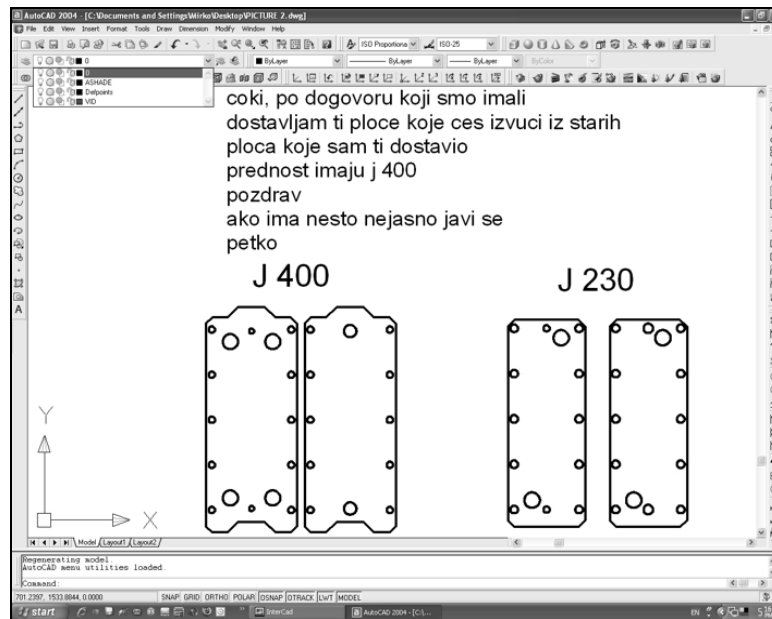
*Picture 2. Example of a drawing done in AutoCAD*

If the drawing done in AutoCAD contains circles or radii, the latter should be composed of multi points. If this condition is not fulfilled the drawn circle or radius will appear to WRYKRYS as a set of broken lines. This problem can be solved by using regen and redraw commands. Regen command in AutoCAD rebuilds a certain virtual image by using basic information from drawing data base, while redraw command regenerates virtual image data and shows all information available in connection to the image. In the picture 3. a comparative examle of difference between drawing before and drawing after using regen and redraw commands is shown.
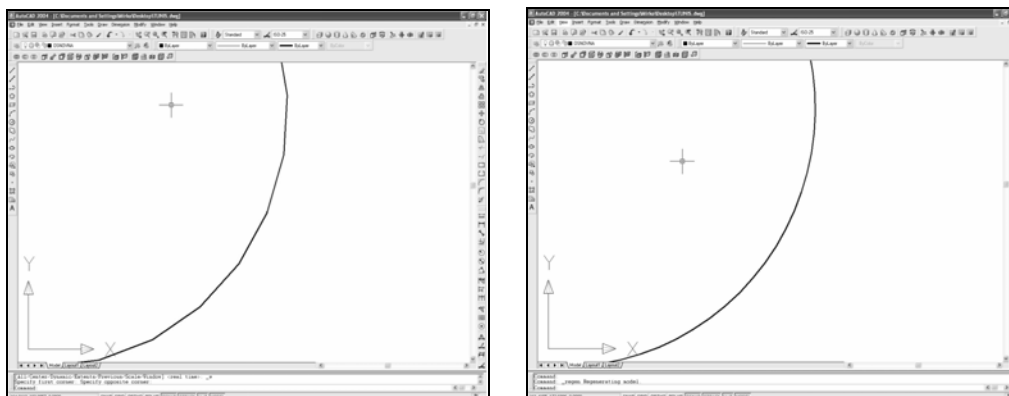
Picture 3. A comparative example of a drawing: a) before using regen and redraw commands and b) after using the commands

72

It is necessary to check the layers in which the drawing has been done while preparing the drawing. Drawing in basic layers, i.e. o and defpoint layers, is not applicable because the lines thus drawn will not be noticed at all by WRYKRYS.

Upon finishing all necessary adjustments we can start with the drawing of the part in AutoCAD. The drawing should have dimensions we want the cut part to have after the cutting process, that is with all (if any) machining allowances and containing no dimensioning or texts (see Picture 4). This is because the drawing should present only the part to be produced by cutting, unlike a technical drawing.
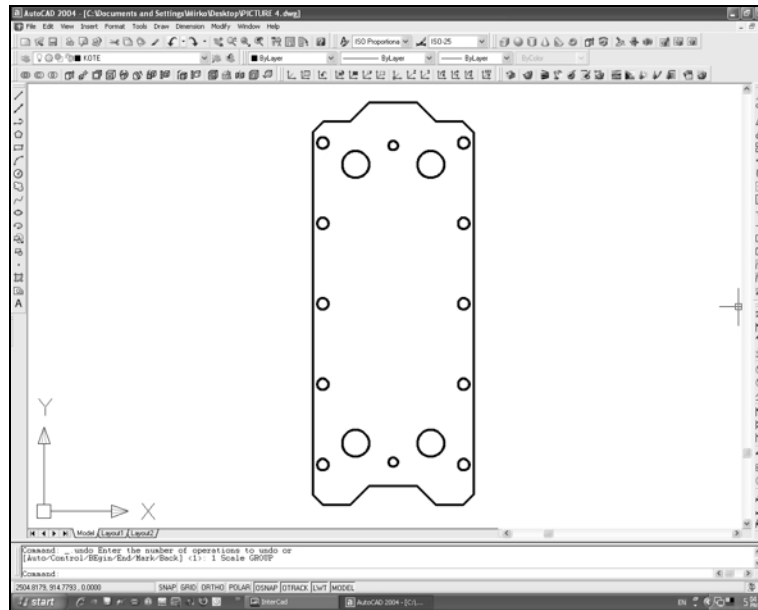

*Picture 4. Drawing application in AutoCAD for cutting process*
on Water jet

3. WORKING WITH AN AUTOCAD DRAWING IN WRYKRYS

The first step should be copying of the drawing in DXF format in order to make the drawing recognizable by WRYKRYS. Copying is done in folder designated for that - c:wrykrys\import. Upon this the drawing can be imported into WRYKRYS.

WRYKRYS has a programme specialized for working with drawings called InterCad. The programme also enables import of files formatted in DFX (see Picture 5).
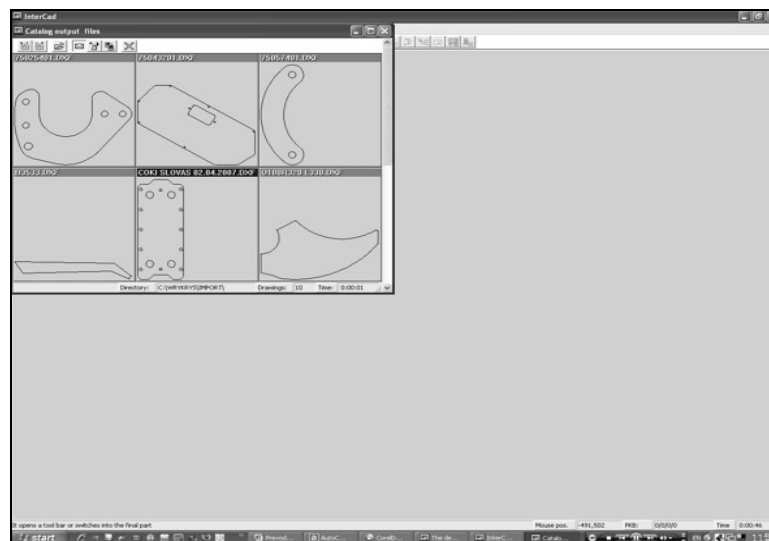
Picture 5. Import of DXF formatted files
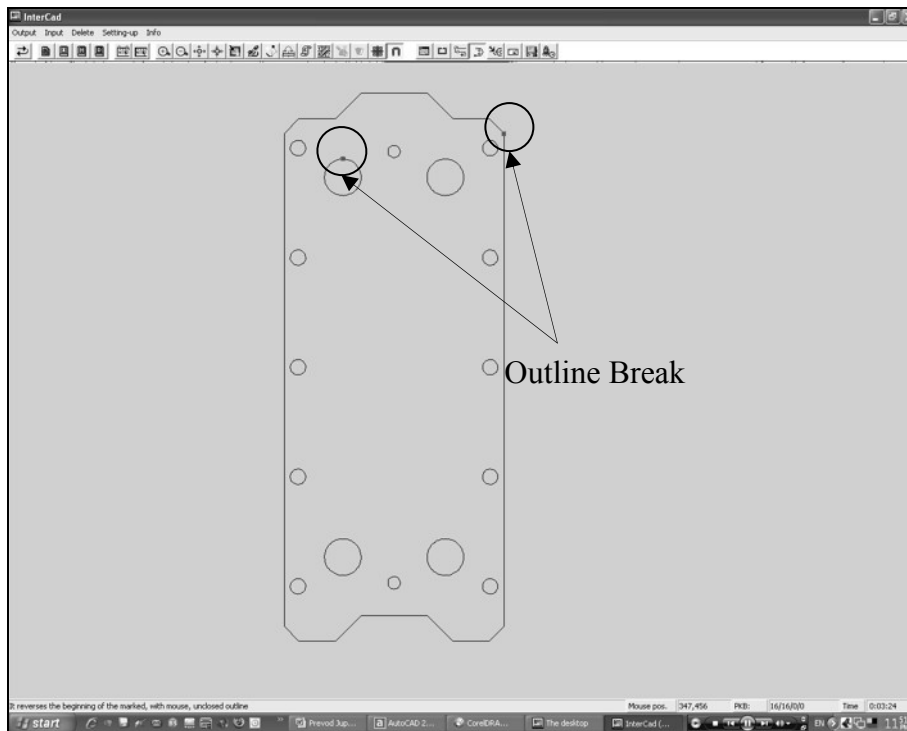
Picture 6. Red and green points marking outline break

Once the import of the drawing is done, it is necessary to check wheather the outline contains any inconsistencies or breaks as already mentioned in the text above. Any outline break is marked by red and green points which actually represent tool inlet and outlet points during the course of cutting process (see Picture 6).

If the application of a drawing in AutoCAD for production of parts on Water jet is done correctly there will be no outline breaks.

4. CONCLUSION

In this work, using AutoCAD programme on Water jet (2D) machine is explained through an example.Water jet machine uses WRYKRYS programme which imports drawings done in AutoCAD. For AutoCAD drawing to be used it is necessary to adjust the drawing, which is explained in this text. A drawing which has not been adjusted can cause great production problems.

5. REFERENCES

[1]   *Radonjić. S.,* Kompjuterska grafika – primena AutoCAD –a, Tehnički fakultet, Čačak (2004).
[2]   *Veliškova I.,*User manual for the program system of Wrykrys, Plzen (2003).