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## MULTIPHASE DESANDER PERFORMANCE MONITORING WITH PRESSURE CONTROL MECHANISM

**Abstract:** Using key thermodynamic properties, the performance of a multi-phase desander deployed to separate solids from crude oil stream could be monitored to ensure effective solid-liquid separation operation. Studies have been done using temperature and flow rate as operating parameters, separately, to monitor performance of multi-phase desanders. In this work, pressure is considered as the operating parameter and the control process using Differential Pressure Cell (DPC) as the controller mechanism. Using a Proportional Integral Derivative (PID) process controller, the performance of the desander was monitored. The work involved the simulation of the solid-liquid separation process of a crude oil stream with the multiphase desander operating at 12bar pressure, and results achieved showed separation efficiencies of 58% to 100% for particle sizes of between 15  $\mu\text{m}$  and 75 $\mu\text{m}$ . The results achieved showed that with PID values of 0.66038, 0.78599/s and 0s, the operation attained stability in 5.53s in the automatic mode, whereas in the manual mode operation, stability was achieved after 7.96s with PID values of 13, 8/s and 7s manually selected. The rise time of the PID pressure controller in automatic mode was 1.35s and in the manual mode of operation it was 0.213s.

**Key words:** Hydrocyclone, Multi-phase desander, Simulation, Separation efficiency, Pressure control, Performance improvement.

**Language:** English

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### Introduction

The use of multiphase desanders in separation of solids from crude oil streams has gained traction. A study on application of multiphase desander technology to oil and gas production looked in-depth at the background of multiphase desanding and its application [1]. The paper further summarized the work achieved in recent times on modelling pressure drop and separation efficiency using Computational Fluid Dynamics (CFD).

A research was further conducted on sand management methodologies for sustained facilities operations [2]. Removal of solid from crude oil streams is a key operation carried out in every oil processing facility and is statutory as recommended by the Department of Petroleum Resources (DPR) in Nigeria under The Petroleum Act (CAP 350 LFN) Mineral Oils (Safety) Regulations 1997 and it forms a major part of technical integrity assurance of risk-prone equipment [3].

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A study was carried on the effectiveness of separation of solid-liquid fluid flow under the operating condition of tangential and axial flow inside the hydrocyclone [4].

Models were developed to study the process. The models were simulated numerically considering the effects of seven particle sizes, two particle concentrations and two feed rates on solid-liquid flow-ability. That study did not consider performance monitoring with a control process. The flow characteristics of hydrocyclones are very complex, hence their performance is evaluated using CFD. The flow in most industrial applications is multiphase and involves interaction between a discrete phase and a multiple continuum phase.

In a study on efficiency of hydrodynamic reservoir, the performance of a hydrocyclone which was characterized by pressure drop split ratio and particles collection efficiency was evaluated using CFD. The work studied the performance of hydrocyclones by applying known turbulence models based on Navier-Stokes equations on turbulence. The performance was assessed using four turbulence models such as renormalization group (RNG) k- $\epsilon$ , Reynolds Stress model (RSM) and Large-eddy simulation (LES) and results compared. With the implementation of RSM, the work further analysed four different configurations in the simulation. The streamlines of these configurations from the individual simulations were analysed and it was found that the formation of vortices and saddle points affect the separation efficiency. The analysis also showed that the effects of inlet width, cone length and vortex finder diameter were significant on the overall performance of the hydrocyclone [5, p. 1-19].

Influence of the vortex finder diameter and length on the performance of a 50 mm diameter hydrocyclone for particle separation was examined [6]. The study appraised critically the grade efficiencies of particles and the cut-size. It was observed that the optimum length of the vortex finder increased first and then decreased with the increase of its diameter. The study showed that large particles (>25 $\mu$ m) are removed entirely when the vortex finder diameter is lower than 20 mm. However, for large vortex finders above diameter 25mm, particles escaped from the vortex finder. Also, negligible impact was recorded when the vortex finder diameter and its length on the cut-size diameter was less than 20 mm. Empirical correlations were established to quantitatively predict the optimum vortex finder length, separation efficiency, and Euler number.

[7] stated that sand control in the oil and gas industry is a phenomenon focusing on the management of sand at production phase. Solids in the fluid stream of producing oil reservoirs have huge impact on the surface processing equipment depending on the operating framework deployed to manage the oil field. The need to deploy surface

processing equipment to manage this phenomenon cannot be over emphasized. To experience production of sand alongside oil and gas will result in erosion and wear of surface production facilities and equipment. The key factors that influence the tendency of a well to produce sand include degree of consolidation of the formation, production rate of the reservoir fluid, drawdown following bean sequence management (differential between reservoir pressure and the well bore pressure), reduction of pore pressure, reservoir fluid viscosity and increasing water production [7].

Sand production from a well is always detrimental to surface processing equipment regardless of the productivity condition. As a key objective in the processing of reservoir fluid, the effective separation of solids from the fluid stream in the processing facility must be given priority attention in order to save the downstream equipment. Operating companies record enormous cost yearly to repair damaged surface equipment inclusive of loss of revenue arising from incessant shutdown of processing facilities. It is very key to keep availability of the processing plant at designed level over a desired duration before intervention when required.

The hydrocyclone, whose principle of operation is used in operating the multiphase desander requires the flow parameters and mechanical properties of the fluid to be monitored to efficiently remove solid particles from the crude oil stream. To maximise this operation, this study is focused on incorporation of a control process with pressure as operating parameter using Proportional Integral Derivative controller to maintain stability for effective functionality of the desander.

Preventing frequent physical intervention of the field equipment, by way of controlling the operation remotely, will ensure improvement of the processing facility. With a pressure control mechanism, the separation efficiency of hydrocyclone would be greatly improved owing to the elimination of disturbances arising from pressure variations.

## 2. MATERIALS AND METHODS

### 2.1 MATERIALS

Materials used for this study include thermodynamic data and software. Some of the materials include operational data for simulation of the various models to validate the results obtained. The data were obtained from one of the multinational oil and gas companies operating in Nigeria.

### 2.2 METHODS

Methods used for the study include fluid flow equations, hydrodynamics models, continuity equations, application of Newton's laws of forces, Laplace transform techniques, and material and energy balance principles.

#### 2.2.1 Modeling of Hydrocyclone and separation efficiency

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The derivation of the hydrocyclone equations was carried out using the material, energy and momentum balance principles. The derivation follows Navier-Stokes equation, Bernoulli's equation and continuity equation [5]. A study was carried out to determine the performance and separation efficiency of a desander. The desander which utilized the working principles of hydrocyclone was simulated and the result showed that separation efficiency of solids from crude oil stream was up to 100% for solid particles sizes of between 75 and 100  $\mu\text{m}$  with working pressure of 12bar [8]. This work has considered the separation efficiency result presented in that study.

### 2.2.2 Control Model Development of Hydrocyclone

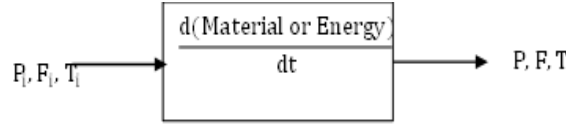


Figure 1: Schematic of Hydrocyclone Block Diagram Indicating Material and Energy Balance

The material and energy block diagram showing the inflow, accumulation and outflow of disturbance variables is shown in Figure 1. From the block diagram and applying Equation (1), the energy balance is given as

$$\left\{ \begin{array}{l} \text{Accumulation rate of materials} \\ \text{within the hydrocyclone} \end{array} \right\} = \left\{ \begin{array}{l} \text{Input rate of materials} \\ \text{into the Hydrocyclone} \end{array} \right\} - \left\{ \begin{array}{l} \text{Output rate of materials} \\ \text{from the Hydrocyclone} \end{array} \right\} \quad (1)$$

From the mass balance of Equation (1), the pressure model is derived as

$$\frac{d(n)}{dt} = F_i - F_o \quad (2)$$

where  $n$  = number of moles,  $t$  is time,  $F_i$  is the initial flow rate of the fluid and  $F_o$  is the output molar flow rate. This can be expressed as

$$n = CV = \frac{P}{RT} V = \frac{A}{FT} \quad (3)$$

where  $C$  = molar concentration of the fluid stream,  $P$  = partial pressure of the fluid stream and  $R$  = gas constant.  $V$  = volume of fluid stream inside the hydrocyclone,  $T$  = temperature of the fluid stream and  $A$  = area of hydrocyclone. The output flow rate can also be written as  $F$  and is related to pressure as [5].

$$F = \frac{C_1 \sqrt[3]{P}}{T} \quad (4)$$

where  $C_1$  = constant related in terms of density, velocity and diameter.

This becomes

$$\frac{d}{dt} \left( \frac{A}{RT} \right) hP = F_i - C_1 \frac{P^{3/2}}{T}$$

The disturbances for the solid-liquid separation of crude in the desander (multiphase hydrocyclone) are flow rates, pressure  $P$ , Temperature  $T$ , and level  $h$ . In a control process, these disturbances would be measured, checked with standard values (set points) and compared, to check the error signals back to the controller using a feed backward control loop. Considering a pressure controller, a mathematical model of the hydrocyclone was applied based on pressure as disturbance variable and converted to transfer functions, a control environment of the process using Laplace Transform approach. The expression of the disturbance variable is the energy equation stated as in equation (1).

$$\frac{A}{RT} \frac{d}{dt} (hP) = F_i - \frac{C_1 P^{3/2}}{T}$$

$$\frac{A}{R} \left\{ \frac{hdP}{dt} + \frac{Pdh}{dt} \right\} = \frac{F_i}{T} - C_1 P^{3/2} \quad (5)$$

Expanding Equation (5) results as follows:

$$\frac{A}{R} \frac{hdP}{dt} + \frac{P}{R} \left\{ aF_i - a_2 h - a_3 \frac{\sqrt{h_0}}{2} \right\} = \frac{F_i}{T} - C_1 P^{3/2}$$

$$\frac{A}{R} \frac{hdP}{dt} + \frac{P}{R} \left\{ a \frac{F_i}{h} - a_2 - a_3 \frac{\sqrt{h_0}}{2h} \right\} = \frac{F_i}{hT} - \frac{C_1 P^{3/2}}{h} \quad (6)$$

The terms  $P/h$ ,  $1/hT$  and  $P^{3/2}/h - 1$  are non-linear which are linearized using Taylor's series (Zill, 2017), as

$$f\left(\frac{P}{h}\right) = f\left(\frac{P}{h}\right)\Big|_{h_0, P_0} + (P - P_0) f'\left(\frac{P}{h}\right)\Big|_{h_0, P_0} + (h - h_0) f'\left(\frac{P}{h}\right)\Big|_{h_0, P_0} + \dots \quad (7)$$

$$\frac{P}{h} = \frac{P_0}{h_0} + (P - P_0) \left( \frac{1}{h_0} \right) + (h - h_0) \left( -\frac{P_0}{h_0^2} \right) + \dots$$

$$\frac{P}{h} = \frac{P_0}{h_0} + \frac{P_0}{h_0} - \frac{P_0}{h_0^2} h = \frac{P_0}{h_0} + \frac{1}{h_0} P - \frac{P_0}{h_0^2} \quad (8)$$

$$f\left(\frac{1}{hT}\right) = f\left(\frac{1}{hT}\right)\Big|_{h_0, T_0} + (h - h_0) \frac{\partial f}{\partial h} \left(\frac{1}{hT}\right)\Big|_{h_0, T_0} + (T - T_0) \frac{\partial f}{\partial T} \left(\frac{1}{hT}\right)\Big|_{h_0, T_0} \quad (9)$$

where

$$f\left(\frac{1}{hT}\right)\Big|_{h_0, T_0} = \frac{1}{h_0 T_0} \quad (10)$$

$$\frac{\partial f}{\partial h} \left(\frac{1}{hT}\right)\Big|_{h_0, T_0} = -\frac{1}{h^2 T}\Big|_{h_0, T_0} = -\frac{1}{h_0^2 T_0} \quad (11)$$

$$\frac{\partial f}{\partial h} \left(\frac{1}{hT}\right)\Big|_{h_0, T_0} = -\frac{1}{h^2 T}\Big|_{h_0, T_0} = -\frac{1}{h_0 T_0^2} \quad (12)$$

Then, applying Equations (9) to (11) into (8) to linearize the term  $\frac{1}{hT}$  now gives

$$\frac{1}{hT} = \frac{1}{h_0T_0} + (h - h_0) \left( -\frac{1}{h_0^2T_0} \right) + (T - T_0) - \left( \frac{1}{h_0T_0^2} \right) T = \frac{1}{h_0T_0} + \left( \frac{1}{h_0^2T_0} \right) h + \frac{1}{h_0T_0} + \frac{1}{h_0T_0} - \left( \frac{1}{h_0T_0^2} \right) T \quad (13)$$

Similarly applying Taylor's series expansion to linearize the term  $P^{3/2}h^{-1}$  we have

$$f(P^{3/2}h^{-1}) = f(P^{3/2}h^{-1}) \Big|_{P_0, h_0} + (P - P_0) \frac{\partial f}{\partial P} (P^{3/2}h^{-1}) \Big|_{P_0, h_0} + (h - h_0) \frac{\partial f}{\partial h} (P^{3/2}h^{-1}) \Big|_{P_0, h_0} + \dots \quad (14)$$

Defining each term of Equation (14) mathematically, it becomes

$$f(P^{3/2}h^{-1}) \Big|_{P_0, h_0} = P_0^{3/2}h_0^{-1} = \frac{P_0^{3/2}}{h_0} \quad (15)$$

$$\frac{\partial f}{\partial h} (P^{3/2}h^{-1}) \Big|_{P_0, h_0} = \frac{3}{2} P_0^{1/2} h_0^{-2} = \frac{P_0^{1/2}}{h_0} \quad (16)$$

$$\frac{\partial f}{\partial P} (P^{3/2}h^{-1}) \Big|_{P_0, h_0} = \frac{3}{2} P_0^{1/2} h_0^{-1} = \frac{P_0^{3/2}}{h_0^2} \quad (17)$$

Applying equation (14) to (16) into Equation (13) to linearized term  $P^{3/2}h^{-1}$  gives

$$P^{3/2}h^{-1} = \frac{P_0^{3/2}}{h_0} + (P - P_0) \left( \frac{3}{2} \right) \frac{P_0^{1/2}}{h_0} + (h - h_0) \left( -\frac{3P_0^{3/2}}{h_0^2} \right)$$

$$P^{3/2}h^{-1} = \frac{P_0^{3/2}}{h_0} + \frac{3P_0^{1/2}}{2h_0} P - \frac{3P_0^{3/2}}{2h_0} + \frac{P_0^{3/2}}{h_0} - \frac{P_0^{3/2}}{h_0^2} h$$

$$P^{3/2}h^{-1} = \frac{P_0^{3/2}}{2h_0} + \frac{3P_0^{1/2}}{2h_0} P - \frac{P_0^{3/2}}{h_0^2} h \quad (18)$$

Substituting Equations (7), (14) and (17) into Equation (5) gives

$$\frac{A}{R} \frac{dP}{dt} + \frac{aF_i}{R} \left( \frac{P_0}{h_0} + \frac{1}{h_0} P - \frac{P_0}{h_0^2} h \right) - \frac{a_2}{R} P - \frac{a_3\sqrt{h_0}}{2R} \left( \frac{P_0}{h_0} + \frac{1}{h_0} P - \frac{P_0}{h_0^2} h \right) = F_i \left( \frac{1}{h_0T_0} - \frac{1}{h_0^2T_0} h - \frac{1}{h_0T_0^2} T \right) - C_1 \left( \frac{P_0^{3/2}}{2h_0} + \frac{3P_0^{1/2}}{2h_0} P - \frac{P_0^{3/2}}{h_0^2} h \right)$$

$$\frac{A}{R} \frac{dP}{dt} + \left( \frac{aF_i}{Rh_0} - \frac{a_2}{R} - \frac{a_3\sqrt{h_0}}{2Rh_0} + \frac{3C_1P_0^{1/2}}{2h_0} \right) P + \left( \frac{aF_iP_0}{Rh_0^2} + \frac{a_3\sqrt{h_0}P_0}{2Rh_0^2} + \frac{F_i}{h_0^2T_0} - \frac{C_1P_0^{3/2}}{h_0^2} \right) h$$

$$= \left( -\frac{aF_iP_0}{Rh_0} + \frac{a_3\sqrt{h_0}P_0}{2Rh_0} + \frac{F_i}{h_0T_0} - \frac{C_1P_0^{3/2}}{2h_0} \right) - \frac{1}{h_0T_0^2} T \quad (19)$$

Let  $C_2 = \frac{A}{R}, C_3 = \frac{aF_i}{Rh_0} - \frac{a_2}{R} - \frac{a_3\sqrt{h_0}}{2Rh_0} + \frac{3C_1P_0^{1/2}}{2h_0},$

$$C_4 = \frac{aF_iP_0}{Rh_0} + \frac{a_3\sqrt{h_0}P_0}{2Rh_0^2} + \frac{F_i}{h_0^2T_0} - \frac{C_1P_0^{3/2}}{h_0^2}$$

$$d = -\frac{1}{h_0T_0^2}, \text{ and } d_1 = -\frac{aF_iP_0}{Rh_0} + \frac{a_3\sqrt{h_0}P_0}{2Rh_0} + \frac{F_i}{h_0T_0} - \frac{C_1P_0^{3/2}}{2h_0}$$

Equation (18) reduces to give

$$C_2 \frac{dP}{dt} + C_3P + C_4h = dT + d_1 \quad (20)$$

Take Laplace transform of the deviation variables (19) Equation to give the transfer functions for pressure, then

$$C_2' \frac{dP'}{dt} + C_3'P' + h' = d'T' + d_1'$$

$$C_2' \mathcal{L} \left\{ \frac{dP'}{dt} \right\} + C_3' \mathcal{L} \{P'\} + C_4' \mathcal{L} \{h'\} = d' \mathcal{L} \{T'\} + \mathcal{L} \{d_1'\}$$

$$C_2' \{s\bar{P}'(s) - P_{(0)}\} + C_3'\bar{P}'(s) + C_4'\bar{h}'(s) = d'\bar{T}'(s) + \frac{d_1'}{s}$$

$P_{(0)} = 0$ , because of the LT boundary conditions

$$(C_2'S + C_3')\bar{P}'(s) + C_4'\bar{h}'(s) = d'\bar{T}'(s) + \frac{d_1'}{s} \quad (21)$$

Take  $s\bar{h}'(s) = a\bar{F}'_i(s) - a_2\bar{h}'(s) = \frac{a_3\sqrt{h_0}}{2s}$  and  $(s + K_{Fh})\bar{T}'(s) + K_{FT}\bar{h}'(s) = \frac{K_T}{s}$  where  $\bar{T}'(s)$  = transfer function of temperature  $\bar{h}'(s)$  = transfer function of level.  $\frac{K_T}{s}$  = transfer function of the disturbance (comprising of  $F'_i, T'_0, h'_0$  and  $u$ ) (Tamunobere et al., 2023)

where  $h'_0$  = deviation variable for the height/level initially,  $h$  = deviation level/height.

Substituting these expressions into Equation (21) yields

$$(C_2'S + C_3')\bar{P}'(s) = d' \left\{ \frac{K_{FT}}{s(s+a_2)(s+K_{Fh})} - \frac{aK_{FT}}{(s+a_2)(s+K_{Fh})} \bar{F}'_i(s) + \frac{K_T}{s(s+K_{Fh})} \right\} - C_4' \left\{ \frac{a}{s+a_2} \bar{F}'_i(s) - \frac{K}{s(s+a_2)} \right\} + \frac{d_1'}{s} \quad (22)$$

The process and disturbance transfer functions for the pressure control using differential pressure cell feedback controller is given as

$$G_{P(s)} = \frac{\bar{P}'(s)}{\bar{F}'_i(s)} = \frac{ad'K_{FT}}{(s+a_2)(s+K_{Fh})(C_2'S+C_3')} + \frac{aC_4'}{(s+a_2)(C_2'S+C_3')} \quad (23)$$

$$G_{d(s)} = \frac{\bar{P}'(s)}{d'} = \frac{1}{s(C_2'S+C_3')} \quad (24)$$

The transfer function is represented in terms of response form for the pressure control as

$$\bar{P}'(s) = \frac{G_{P(s)}G_f(s)G_c(s)}{1+G(s)} P'_{sp}(s) + \frac{G_d(s)}{1+G(s)} P'_d(s) \quad (25)$$

where

$$G_f(s) = G_m(s) = 1$$

$$G(s) = G_{P(s)}G_f(s)G_m(s)G_c(s)$$

$$G_c(s) = k_c \left( 1 + \frac{1}{\tau_I s} + \tau_D s \right)$$

Thus,  $G(s) = \frac{ad'K_{FT}+ac_4'(s+K_{Fh})}{(s+a_2)(s+K_{Fh})(C_2'S+C_3')} k_c \left( 1 + \frac{1}{G_s} + \tau_D s \right)$

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$$\bar{P}'(s) = \frac{ad'K_{FT} + ac'_4(s + K_{FH})}{(s+a_2)(s+K_{FH})(C'_2s+C'_3)} \frac{1}{1+G(s)} P'_d(s) + \frac{1}{s(C'_2s+C'_3)} P'_d(s) \quad (26)$$

### 3 RESULTS AND DISCUSSION

The block diagram shown in Figure 2 is a closed loop feedback PID pressure controller showing the transfer function and the necessary step inputs for smooth process response. The processing of these streams of crude oil is designed such that it exits the desander and further processed via the respective separators installed for low pressure and high pressure wells.

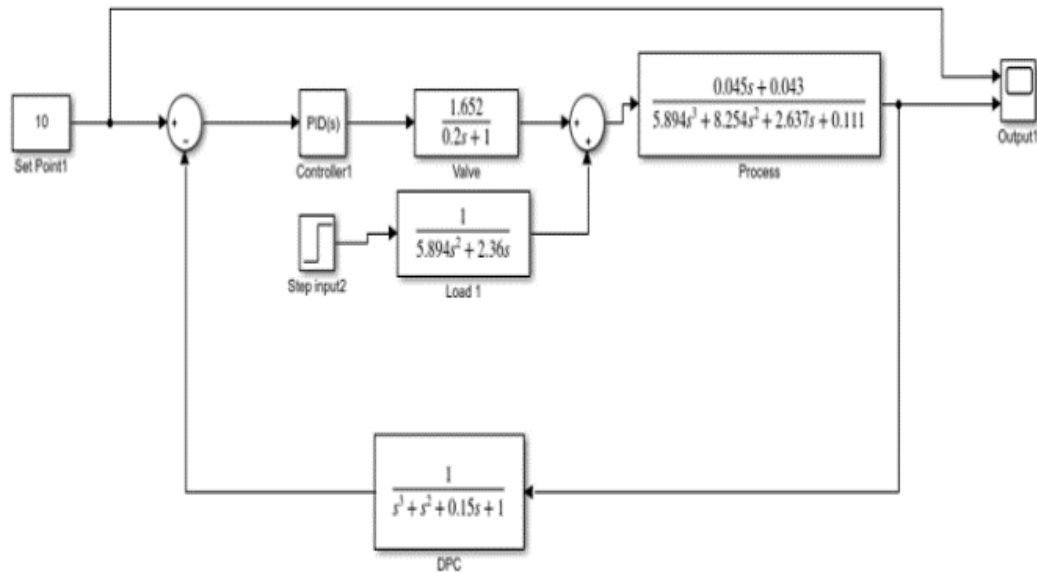


Figure 2: Block Diagram for a Closed Loop Feedback PID Pressure Control

Based on the design of the processing facility, all high pressure wells are routed to the high pressure separator and pre-set to operate at 12bar, which reduced the pressure to 3bar as the outflow. Figure 2 further shows the configuration of the control process using a differential pressure cell DPC to measure the pressure output to compare with the set point. The simulation was carried out in SIMULINK MAT-LAB.

Figures 3 to 5 show the result of the controller with various manually manipulated PID values with the desire to attain process stability and enable the hydrocyclone perform to achieve the simulated efficiency. No stability was, however, achieved with the manually selected PID values as shown in the figures.

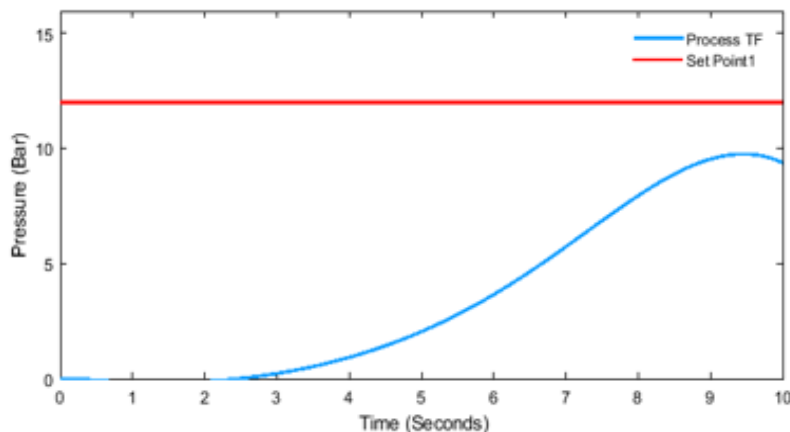
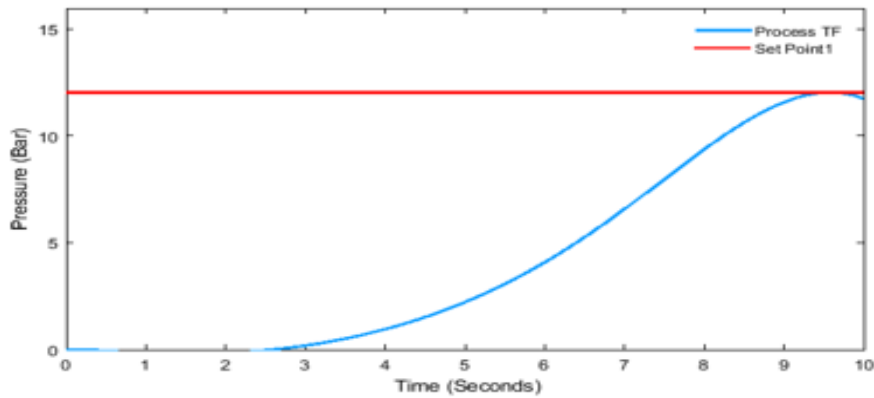


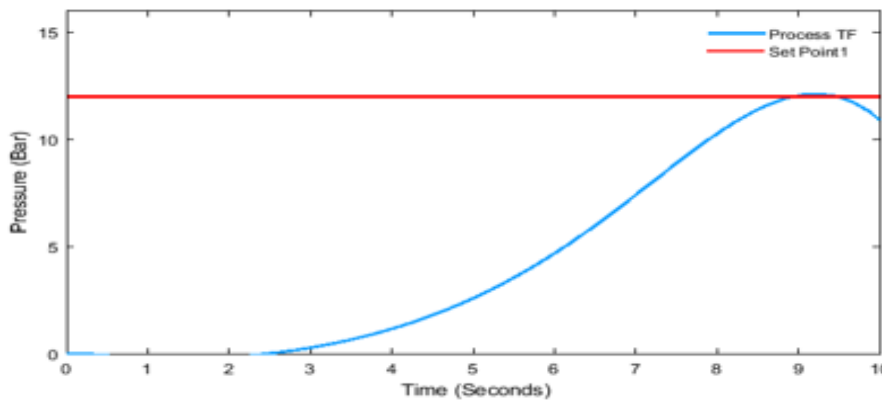
Figure 3: Pressure vs Time Graph of the controller with PID data 2.5, 1.25/s, 1.55s

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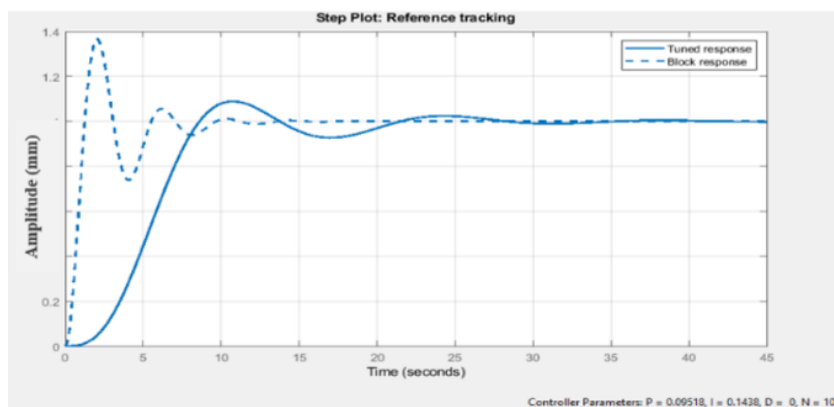
**Figure 4: Pressure vs Time Graph of the Controller with PID Values of 3,1.05/s,2s**



**Figure 5: Pressure vs Time Graph of the controller with PID data 4, 1.25/s,2.3s**

Stability was attained when the controller was operated in automatic mode. Figure 6 shows the amplitude of response of the controller in both manual and automatic modes. PID values were selected accurately by the controller to achieve the desired stability. The manipulated PID values (13, 8/s,7s) to

operate the controller showed a huge overshoot of 1.6m and stabilized at the set point after 5.53 seconds. Furthermore, the manually tuned process response was faster to correct the overshoot when compared with the automatic mode.



**Figure 6: Transient Response Amplitude vs Time Graph of Pressure Controller with Tuned and Blocked PID Values**

The rise time of the automatically manipulated process was higher but the overshoot was very small. The rise time was 1.35s for the automatic mode whereas as the manual mode resulted in 0.213s and

settling times were 5.53s and 7.96s respectively. This shows that it took less time for the process to reach the desired output with the controller automatically selecting PID data.



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#### 4. CONCLUSION

The efficiency of the hydrocyclone was successfully determined with various particle sizes at the operating pressure of 12bar. The achieved efficiency was between 58% and 60%. The larger particle sizes achieved 100% separation efficiency while the smaller particle sizes achieved between 58% and 60% efficiency.

Table 1 shows the corresponding input data of the controller performance in processing the input to achieve the desired response with pressure as the control variable. The table further shows the performance of the PID controller with two sets of data. The process of the controller was compared using data generated by the system and those manually selected.

**Table 1: Controller Parameters for Automatic and Manual Pressure Control**

Controller Parameters	Tuned	Blocked
P	0.66038	13
I	0.78599	8
D	0	7
N	100	100
<b>Performance and Robustness</b>	<b>Tuned</b>	<b>Blocked</b>
Rise time	1.35 seconds	0.213 seconds
Settling time	5.53 seconds	7.96 seconds
Overshoot	12 %	63.6 %
Peak	1.12	1.64
Gain margin	8.63 dB @ 1.93 rad/s	12.5 dB @ 11 rad/s
Phase margin	60 deg @ 0.795 rad/s	10.8 deg @ 5.51 rad/s
Closed-loop stability	Stable	Stable

The tuned data were those generated by the system whereas block data were those selected manually to monitor the PID controller performance.

The rise time which is the time required for the output of the controller to increase from 0.1 to 0.9 of its final value was 1.35 seconds for the tuned data and 0.213 seconds for the manually selected PID data. The settling time was 5.53 seconds for the tuned data whereas that for the manually selected PID data was 7.96 seconds. This shows that it took more time for the process to reach the desired output with manually selected PID data. Both operating modes show desirability in selecting the performance monitoring process of the multiphase desander

h	Level	m
P	Pressure	N/m <sup>2</sup>
Q	Hydrocyclone Input Rate	m <sup>3</sup> /s
R	Gas Constant	J/mol.K
s	Second	s
T	Temperature	K
t	Time	s

#### Greek Symbols

$\rho$	Fluid Density	kg/m <sup>3</sup>
$\mathcal{L}^{-1}$	Inverse Laplace Transform	
$\tau_i$	Response Time	s

#### 5. NOMENCLATURE

##### English Symbols

C	Concentration	mol/m <sup>3</sup>
F	Flow Rate	m <sup>3</sup> /s

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Article



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## STAGE INTERPRETATION OF THE WORKS OF CHINGIZ AITMATOV IN THE THEATERS OF UZBEKISTAN

**Abstract:** The article analyzes the influence of the work of the famous Kyrgyz writer Chingiz Aitmatov on the Uzbek stage art, ideological and artistic features of the performances staged in theaters of Uzbekistan based on the writer's work. The author considers the degree of influence of Aitmatov's prose on updating forms and styles in Uzbek direction, acting and scenographic arts, on the development of drama and musical drama genres, and the formation of a theater repertoire. The article also discusses the features and criteria for staging prose works on the example of the work of Chingiz Aitmatov.

**Key words:** Chingiz Aitmatov, dramatization, prose, director's interpretation, musical drama, legend, genre, story, scenography, acting performance.

**Language:** English

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### Introduction

UDC: 792.09 (575.1)

Chingiz Aitmatov, who entered the treasury of the universal heritage with his work, had a tangible impact on the development of world artistic thinking. The factor determining the phenomenon of Aitmatov is that he rose above the narrow national framework, and philosophically comprehended the problems of all mankind, on a cosmic scale displayed the relationship between man and era, personality and society, the eternal struggle between the ideal world and base dogmas. Therefore, the writer's works found a response in the hearts of millions of readers, translated into hundreds of languages of the world, and this process continues to this day.

In his works, the writer fruitfully used ancient tales, myths, legends that live in the memory of the people, skillfully synthesized life and fictional storylines. The symbolic images of the legends not only reflect the philosophical views of the writer, but also determine the artistic world, poetics, and drama of the works.

The creative range of comprehension of such a prominent writer as Chingiz Aitmatov is not limited only to the field of literature. Based on his works, theatrical performances, films, paintings were created, they were also reflected in other areas of cultural life, which allows us to conclude that they can and should be studied from the point of view of art criticism. The writer's short stories and novels have been staged in theaters in many countries and have served and continue to serve as an inexhaustible artistic source and rich material for theatrical figures. Philosophical images built on symbols, heroes with a strong character, drama based on social contradictions are close to the nature of theatrical art, thanks to which they served as the basis for artistically mature stage works.

“Plays based on the works of Ch. Aitmatov are successfully staged in many theaters in Russia and in the homeland of the writer. Naturally, in each production, national features of acting art make themselves felt” [1, 209 p.].

A number of studies have been carried out on the stage interpretation of the works of Chingiz Aitmatov.

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Among them, Dzhukun Imankulov's doctoral dissertation "Chingiz Aitmatov and the Soviet multinational theater" and his monograph "The Art of the Theater: Works by Chingiz Aitmatov on the stages of theaters of the republics of Central Asia and Kazakhstan" should be especially noted [2, 3]. The author analyzes the performances staged based on the works of Chingiz Aitmatov in the theaters of Kyrgyzstan, Kazakhstan, Tajikistan, Turkmenistan and, partially, Uzbekistan.

"The Aitmatov Theater is a world of major social problems, deep feelings and big ideas, often the general tone of this world is tragic. It reflects the best examples of world artistic culture — from the Ancient East and the ancient world to the present day," [2, 4 p.] — the author writes. In the process of working on productions, the imaginative thinking of the director, the intuitive mind of the actor develops, and the desire for individuality among all stage masters increases. Elsewhere, he writes: "Aitmatov's conflicts are sharp, characters are strong, nature is spiritualized, and the theater conveys all this to the viewer, influencing not only his mind, but also feelings, since theatrical art is primarily emotional" [2, p.8]. I will add here that Aitmatov's works have no temporal or spatial boundaries, they are consonant with the views of different eras, and can serve as a platform for topical ideas of any time.

The work of Chingiz Aitmatov is a special page in the history of the Uzbek theater. The famous stories and novels of the writer were repeatedly staged in the theaters of our country and helped the creative growth of directors and actors, the popularization of amazing symbols and experiments, the development of poetics and the artistic world of the stage.

The first experience of staging the works of the writer was carried out in 1964 by the famous director Tashkhodzha Khodzhaev. The performance "Sarvkomat dilbarim" ("My poplar in a red scarf"), staged on the basis of the translation of the poet and playwright Hamid Gulyam, conveyed passion, beautiful and sincere love, pure feelings inherent in young hearts in a lyrical and dramatic form, which gave the audience a special aesthetic pleasure.

As you know, the story "My Poplar in a Red Scarf" is a romantic work, with a rich poetic language and full of lyricism, which tells about the beautiful and dramatic love of two young people. When staging the story, it was necessary to pay attention to these features of the work and the obligatory preservation of emotional coloring. Not everything worked out for the theater when transferring prose to the stage. N. Zakhidova writes about it: "The author of the staging A. Kotelnikov, trying to concentrate the events of the story and squeeze them into the genre of dramatic comedy, failed to convey the laconic poetry inherent in the writing style of Ch. Aitmatov. There are many fragmented episodes in the staging, moreover, some of them do not work for the main idea of the work" [4,

88-89 p.]. Shortcomings in the staging were to a certain extent eliminated with the help of the director's interpretation and acting.

The image of Ilyas in the performance was performed by Turgun Azizov. The actor's performance filled with emotions, the purity of the flame of youth he felt, his lyrical and dramatic skill left a good impression on the audience.

The image of one of the main characters of the story — Asal occupies an important place in the development of events. "Her feelings are transmitted indirectly, through other images, through the actions and stories of other characters" [5, 89 p.]. The role of Asal was played by two talented theater actresses — Iroda Aliyeva and Oydin Norboeva. Both actresses, based on their manner of performance, interpret the image in different ways. Asal, performed by Iroda Aliyeva, attracts attention with a penchant for lyrical experiences, a variety of emotional colors, and the heroine Oydin Norboeva is distinguished by high drama, rising to pathos.

This work was staged in 1978 at the Mukimi Musical Drama Theater under the title "Qizil Durrali Nozik Niholim" ("A Delicate Tree in a Red Scarf"). Playwright Hamid Gulyam, director Abdurashid Rakhimov and the theater troupe, having deeply felt the poetic content of the work, conveyed its lyrical intonations, artistic originality in the genre of musical drama.

The image of Asal was performed by actress Naima Pulatova. Thanks to a pleasant voice, arias filled with pain and sadness, vocal and dramatic possibilities, the actress, revealing the character of the heroine, perfectly conveyed the essence of the image.

If in the interpretation of the National Theater the main attention is paid to the drama of the story, the internal contradictions of the characters, then in the Mukimi Theater the main place is given to the transmission of the lyrical sound of the work, poetic motifs.

In 1965, the team of the Mukimi Musical Drama Theater staged the writer's novel "Mother's Field". The author of the staging was the poet Turab Tula. Director Abdurashid Rakhimov, composer Ilyas Akbarov transferred the poetics of the story, its warmth to the language of music.

The role of the main character Tolgana in a passionate and pretentious manner was played by Tursunkhon Jafarova. The strong character and inner feelings of a woman who survived all the horrors and heavy blows of the war determine the main idea of the performance. "Compared to Aitmatov's story, a certain re-emphasis of images took place in the musical drama. Aliman becomes the main character. But Tolgonai also remains an important, though no longer the only figure in the play" [6, 98 p.].

Experts note the musicality of the language and style of presentation of the writer. Indeed, when reading the writer's stories, the reader, as it were, feels

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music in his soul. It is this feature that speaks of the closeness of Aitmatov's prose to the genre of musical drama. "The perception of the content of a literary work through music expands the boundaries of the impact of prose" [7, 281 p.].

In 1979, on the stage of the Surkhandarya Regional Theater of Musical Drama, director Mansur Ravshanov staged a performance based on the story "Mother's Field" (the authors of the staging are O. Khozhimurodov, S. Kurbonklichev). The director, having preserved the color and spirit of the work, created the performance in accordance with the criteria of the theater. The image of Tolgana, performed by the actress Gulnora Ravshanova, embodied national and universal values, and acts as a symbol of a woman whose being is overwhelmed with a feeling of hatred for the war and embodies the pain and sorrow of all mankind.

The story "The White Steamboat", which brought world fame to Chingiz Aitmatov, was staged in several theaters of our country, and each production is distinguished by its own approach. First of all, when staging a work, its genre should be taken into account. V. Voronov defined the genre of The White Steamboat as a story-parable [8, 186 p.]. This definition is not unfounded. Since The White Steamboat is not a purely realistic story, reality is intertwined with fantasy in it.

In 1983, The White Steamboat was staged at the Theater for Young Spectators by director Mahkam Mukhammedov. Chingiz Aitmatov personally attended the premiere and after the performance he talked with its creators.

The director, penetrating the philosophical content of the story, created a touching, colorful, rich in symbols and allegories, interesting performance. Actress Yodgora Ziyokhamedova, who played the role of the central character, the Boy, became a real tuning fork of the performance, remembered by the audience for her sometimes cheerful, sometimes sad look, sonorous and full of sorrow voice, expressive silence.

As you know, in the story, two tales in the boy's imagination set the stage for the main conflict. The first of these tales, that is, the story of the white steamer, is a figment of his imagination, and the second parable - about the mother deer, he heard from his grandfather. The director, proceeding from the fact that the mother deer is a symbolic image, shows her appearance on the stage in a conditional form: her majestic shadow is displayed on the curtain, which is set in motion with the help of light.

Then the story "White steamboat" was staged on the stage of the Surkhandarya Regional Theater of Musical Drama by the director Nemat Pardaev (authors of the staging are O. Hozhimurodov, S. Kurbonklichev). The peculiarity of this performance is that the main attention is directed to the disclosure of the social and tragic content of the work. The

director in the play, through the murder of a mother deer, exposes all the vices and intrigues of a degraded society.

In conveying the idea of the performance and the thoughts of the director, the scenographic solution of the artist Viktor Mikhailichenko occupies a particularly important place. The scenery on the stage in the form of a space surrounded by a wooden fence resembles a sheep pen. At the end of the play, this corral is engulfed in flames, and, as it were, they convey the idea that all the baseness, abomination, evil intentions that cause suffering and death of the boy are burned and turned into ashes.

Another experience in staging the works of Chingiz Aitmatov was carried out in 1986 at the Khamza Theater (now the Uzbek National Academic Drama Theater) by director Rustam Khamidov. A performance based on the novel by the writer "And the day lasts longer than a century" was staged on the stage of the theater.

The director R. Khamidov directed all his attention to the events connected with the fate of the protagonist of the novel Edigei. The performance was staged by Kazakh director Azerbaijan Mambetov. A. Mambetov staged a number of works by Chingiz Aitmatov on the stage of the Kazakh Academic Drama Theater named after M. Auezov and has extensive experience as a stage manager.

In conveying the idea of the performance, the decisive role belongs to Zikir Muhammadjonov, who skillfully played the role of Edigei Buranny. In the interpretation of the actor, Edigei appears as a patient, strong-willed, devoted person, obeying only the dictates of conscience, thinking about the people around him, living with their troubles and suffering. "The strength of this image, its distinguishing feature, is that it feels involved in the events taking place around and treats life with all responsibility" [9, 210 p.].

The scenography of the performance is also distinguished by its originality and complexity of construction. The train rails raised above the proscenium and a spinning ball below them give the impression that events are taking place above the globe. The noise of the train coming from behind the stage sounds like a hint of long roads full of ups and downs in the fate of Yedigei.

As you know, the legend of the mankurt is one of the main episodes of the novel. As Viktor Levchenko noted, "In the legend, Aitmatov remains himself, he relies on the reality that entered him with his mother's milk; it does not need to be invented, colored and decorated — the colors involuntarily show through from the inside" [10, 199 p.]. The creators of the play also paid special attention to the legend of the mankurt. The role of the mankurt is played by Yodgor Sadiev, the suffering mother Naiman is Sara Eshonturaeva. This impressive scene reveals a terrible picture of memory loss, the loss of

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one's essence, and that this tragedy concerns all of humanity.

During the years of independence, creative searches continued in the field of staging the works of Chingiz Aitmatov on the stages of theaters in Uzbekistan. The most successful among such experiments was the play "Naiman on nidoshi" ("Mother's Call"), staged on the stage of the theater-studio "Eski machit" in the city of Karshi in 1999 by the People's Artist of Tajikistan, director Farrukh Kasimov. Created on the basis of the legend of the mankurt in the novel "And the day lasts longer than a century", the performance impresses with its unusual form, philosophical solution, and symbolic elements.

The director mainly uses such means as plasticity, dance, music, song, movement, facial expressions of actors. Dynamic mise-en-scenes also serve to enhance the drama of the work.

The performance begins with a scene that conveys a picture of a bright and calm life. In the middle of the scene is a butter churn where Zhulamon (actor Isok Turaev) works, enjoying his youth, overflowing with life's joy. This peaceful life is violated by invaders. They pull Zhulamon out of his mother's arms, tie him up and take him away.

Zhulamon is tormented by various tortures, a camel skin is put on his head, as a result, the guy loses his essence, memory. Now he is turning into a merciless creature, remembering nothing, capable only of killing and destruction. The butter churn, which at first expressed pure thoughts, turns into a dwelling, which is worshiped by mankurts.

Actor Isok Turaev, who played the role of Zhulamon, skillfully showed the difficult state, mental tension, unconsciousness of his hero. The haunted look, the movements of the actor convey the tragedy of the mankurt in all its terrible essence.

The central image in the performance was the image of the mother of the mankurt Naiman she. The heartache and suffering of the unfortunate mother are deeply felt in the performance of tragic songs, sad lullabies performed by the Honored Artist of Uzbekistan Oygul Khalilova. The performance "Naiman on nidoshi" ("Mother's Call") in 1999 received the main prize - the Grand Prix at the authoritative theater festival of performances based on the works of Chingiz Aitmatov, held in Bishkek.

The Decree of the President of the Republic of Uzbekistan "On the wide celebration of the 90th anniversary of the great writer and public figure Chingiz Aitmatov" dated April 2, 2018 was of great importance for theater groups. Many theaters enthusiastically responded to the task of creating performances based on the works of the Kyrgyz writer.

In particular, the story "The White Steamer" was staged on the stage of two theaters of the country – the Uzbek National Academic Drama Theater (directed by Abubakr Rakhimov) (Figure 3.4) and the

Kashkadarya Regional Musical Drama Theater (directed by Askar Kholmuminov).

Both directors offered their own interpretation of the story. A. Rakhimov paid special attention to the poetic appeal of the story, in collaboration with the artist B. Turaev, he found a figurative solution depicting the beauty of the nature of Issyk-Kul region. And in the Kashkadarya theater, the young director Askar Kholmuminov sought to convey the socio-philosophical content, the tragic spirit of the work. Therefore, this performance is dominated by drama, psychologism. In particular, it should be noted the successful creative tandem of the young actor Sukhrob Isomov, who played the role of a boy and the People's Artist of Uzbekistan Erkin Komilov as the old man Mumin. Both of these actors become real grandfather and grandson, they feel and understand each other on stage through their views, while performing, their spiritual unity, spiritual intimacy appears.

In connection with the anniversary of the writer, performances such as "My Poplar in a Red Scarf" were staged at the Mukimi Musical Drama Theater (director M. Azizov), "Jamilya" at the State Drama Theater of Uzbekistan (director G. Mardonov), "Mother's Field" in the Syrdarya Regional Musical Drama Theater (director N. Goyibnazarova), "Duck Louvre" in the Karakalpak State Musical Drama Theater named after Berdakh (director M. Reimov).

In conclusion, it should be noted that the works of Chingiz Aitmatov served and serve as a rich source for the theater. Practical proof of this can be seen in the example of Uzbek theatrical art. The works of the prose writer have always been in the center of attention of stage masters, because they have a rich socio-philosophical content, are full of symbolic images, based on ancient legends and myths, imbued with universal meaning.

An analysis of the stage performance of the works of Chingiz Aitmatov in the theaters of Uzbekistan makes it possible to draw the following conclusions:

– Based on the works of the writer, a number of performances in the genre of musical drama ("My Poplar in a Red Scarf" and "Mother's Field") were created in the theaters of the republic. Thanks to the poetry and lyricism of his prose, the expressive means and styles of musical theater were enriched.

– The writer's prose to a certain extent had an impact on the formation of a symbolic theater in the Uzbek theatrical art. ("White steamboat", "Spotted dog running along the edge of the sea").

– The writer's work played the role of a source for the stage works of a socio-psychological plan ("And the day lasts longer than a century", "Jamilya");

– In view of the closeness of the national spirit of the Kyrgyz people, the color of the Kyrgyz literature, with the national spirit of the Uzbek people, the work of Ch. Aitmatov had a beneficial effect on



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the development of the national identity of the Uzbek theater.

– The works of the writer provided rich material for the development of the creative potential of

directors, the dramatic and vocal abilities of actors, the imagination of stage designers and other theatrical figures.

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## PROBLEMS OF ILLEGITIMATE EMPLOYMENT OF YOUNGSTERS

**Abstract:** In this article, comparing the laws of Uzbekistan and Islamic law on the involvement of youths in labor, the consequences of this case, the fact that father and mother are responsible for the effective spending of free time of the child from a young age are given. It was emphasized that the father and mother and close relatives play a big role in the child's successful growth in the future. The fact that the father appears as a perfect person in the eyes of his child at home, when walking and communicating with members of society is an important factor for the child to grow into a mature person.

**Key words:** Adolescent, child, mahram, child's right, obligation, wajib, law.

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### Introduction

It is known from history that any society that is lagging behind modern science is definitely in crisis and dependent on foreign invaders. That is why our Prophet Muhammad, may God bless him and grant him peace, ordered the ummah to "teach your children to swim, ride a horse, and shoot archery."

In the past, our forefathers taught young people that a person should work honestly and live professionally, not to be lazy, idle, and not to make a living in unclean ways. When our mothers sent their few halals to earn money, they were appointed to earn money only in an honest way, through hard work, and advised them, "We can endure poverty and hunger, but we cannot endure the fire of hell."

Teaching a child, a profession from a young age is an important task of parents. It was not for nothing that our great poet Alisher Navoi wrote from the language of the hero of one of his epics: "Hunarni

asrabon netkumdir ahir, Alib tufrokkamu ketkumdir ahir." The famous oriental poet Nizami Ganjavi was right a thousand times when he wrote: "Each craft learned will benefit the craftsman one day." In one of the wisdoms: "If anyone has no money, but has a craft, there will be no danger in the world. That's why a person should be decorated with handicraft jewelry. His Holiness Alisher Navoi also said: "A person who has no skill alone is a person who is alone in the number of people." That is, even if there are a hundred people, if there is no knowledge, one person is counted, and a single person will never be counted among mankind.

There are also legal grounds for making a child interested in a profession from a young age and raising him to be a hard-working and ambitious generation. Here are some of them:

A young child under the care of a father or grandfather, as well as the guardians of both of them,



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can hire him for some service. These people have the right to use the child's labor even if they do not pay for their labor for the purpose of teaching and training. In fact, it is appropriate to pay for their work. Society always needs people with professions such as doctors, builders, weavers, teachers, defenders of the Motherland, gunsmiths, car drivers, and bakers. Whoever has the right to provide a young child with a service in the form of a rental, can also receive the fee for this service. Since rent is also a right related to the contract, this right belongs to the person who concludes the contract. The lessor does not have the right to spend even if he is entitled to the fee given for the service to the child. Because this property belongs to the child. Father, grandfather and these two No one other than guardians has the right to dispose of the property of a young child. Also, although the person taking care of the property given to the child can own it, he does not have the right to spend it. According to Imam Muhammad, if necessary, it is appropriate for a young child to spend this property for himself, because keeping it without spending it is harmful for a young child [ 1, p.35-36].

In addition, if the child's father was not a weaver, the person who later took care of him does not have the right to hire him as a weaver. The harmful side of this profession can affect the honor and social status of a young child [ 2, p.130-131].

Involvement of minors in hard labor . Regardless of whether it is compulsory or voluntary, it is prohibited to use the labor of minors in certain types of work.

To prevent the use of minors' labor ", it is not allowed to use the labor of persons under the age of 18 in work related to lifting and transporting heavy loads exceeding the established norm. Child lifting impossible weight standards are defined in the decision on approving the regulation on setting the limit of heavy load standards that persons under 18 years of age can carry and transport [ 3, p.1-2].

According to Article 49-1 of the Code of Administrative Responsibility, one time of the minimum wage against persons who violated the requirements to prevent the use of the labor of minors, who used the labor of a minor in work that could harm his health, safety, or morals shall be fined up to three times. If it is committed together with the crime of forced labor, it is considered an aggravating circumstance and the punishment measures are increased accordingly.

Therefore, according to the legislation, the involvement of minors in work related to lifting heavy loads beyond the above standards, either voluntarily or by force, is considered illegal, and the person involved in such work will be held accountable.

Contains a set of rules regulating the employment of young children in the cultivation and harvesting of agricultural products. A person who is not well-informed about all the legal norms on the

subject can accept this set of rules as if it were a document regulating the export of children to cotton. In fact, it is not. Because picking cotton by children is prohibited in Uzbekistan based on the following legal norms:

Labor and Social Protection of the Population and the Ministry of Health adopted on June 26, 2009, "The list of jobs with unfavorable working conditions in which the labor of persons under the age of eighteen is prohibited", it is determined that persons under the age of eighteen should not be involved in manual cotton picking. So, it turns out that the set of rules regulating the use of the labor of pupils and students in the cultivation and harvesting of agricultural products does not apply to cotton picking. Because manual picking of cotton is included in the list of unfavorable working conditions for minors.

The document does not provide information about the types of agricultural work. In the rules, this document was developed in accordance with the decisions of the Cabinet of Ministers of the Republic of Uzbekistan "On revision and development of regulatory documents on labor protection" [4, p.134-135] and "On further improvement of the normative legal framework on labor protection". is said to have been issued.

According to the 12th rule of the document, in accordance with Article 77 of the Labor Code of the Republic of Uzbekistan, it is noted that employment is allowed from the age of sixteen. At the same time, in order to prepare young people for work, students of general education schools, vocational schools, in order to do light work that does not harm their health and spiritual and moral development, does not disrupt the educational process, in their free time from studying - after they turn fifteen years old, one of their parents or with the written consent of one of the substitutes of his parents[5, p.884]. Therefore, one of the conditions for the involvement of minors in such work is that such a cocktail should not disrupt the educational process of children, that is, they must attend school or academic lyceum every day and have extra time after school to do homework, after which they can go out if they have time.

Another point is that in order to participate in such activities, the minor must agree and want to participate. Otherwise, it will be forced labor. As we mentioned above, forced labor is prohibited based on the "Labor Code" and a number of other legal documents. In addition, if the parents of a minor do not want to participate in work, the child cannot participate even if he wants to[6, p.214]. Therefore, minors may be involved in non-prohibited agricultural work, first of their own free will, and then with the consent of their parents.

The Republic of Uzbekistan ratified the Convention on the Minimum Age for Employment, the Convention on Forced Use or Forced Labor, the Convention on Urgent Measures to Prohibit and

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Eliminate Severe Forms of Child Labor, and on September 12, 2008, the Cabinet of Ministers approved the Convention "Ratified by the Republic of Uzbekistan adopted a decision on measures to implement the Convention on the Minimum Age for Employment and the Convention on Urgent Measures to Prohibit and Eliminate Severe Forms of Child Labor[7, p.553]. According to this decision, in connection with the ratification of the above-mentioned two conventions, a National Action Plan (NAP) was developed for the implementation of its norms into national legislation.

In September 2008, Part 1 of the NAP, it is established that a working group should be established to conduct monitoring on the ground in order to prevent the use of forced labor of students of general education schools in cotton harvesting work. According to paragraph 20, part 2, every year in August-November, on-site monitoring should be carried out in order to prevent the use of forced labor of students of general education schools in cotton harvesting. Clause 20, part 3 states that on September 10, October 10, November 10, and December 10 every year, the analytical report on the monitoring results should be submitted to the Cabinet of Ministers along with relevant proposals, and the Ministry of Public Education, the Ministry of Labor and Social Protection of the Population, the Ministry of Foreign Economic the Ministry of Communications, Investments and Trade, the Council of Ministers of the Republic of Karakalpakstan, regional and Tashkent city administrations are determined to be the responsible executors.

Particular attention should be paid to the phrase "university schools" in paragraph 20 of the NAP. Because students of general education schools consist of children up to 15-16 years of age, students of academic lyceums and vocational colleges, which are the next level of education, are not included in the number of students of general education schools. But most of them are under 18 years old. Based on the wording used in the document, NAP does not provide students of academic lyceums and vocational colleges under the age of 18 with legal protection against forced labor. This means that the NAP contradicts other legal norms regulating the labor of minors. In fact, in the text of the document, the term "under 18" or "minors" should have been used[8, p.1061]. According to international law, any minor under the age of 18 who has not been emancipated is considered a child. In order to ensure the implementation of the above-mentioned international conventions, the Cabinet of Ministers of the Republic of Uzbekistan on March 26, 2012 approved the "Convention on Forced Use or Forced Labor and the Convention on Urgent Measures to Prohibit and Eliminate Severe Forms of Child Labor, ratified by the Republic of Uzbekistan in 2012". "On additional measures for implementation in 2013"[9, p.6735]. According to the decision, a plan of

additional actions planned to be implemented in 2012-2013 (hereinafter referred to as the Plan of Actions) was adopted for the implementation of the adopted conventions into national legislation.

In paragraph 14 of this action plan, the error made in the previous NAP has been corrected. According to it, in order to prevent the use of forced labor of students of general education schools, academic lyceums and vocational colleges, on-site monitoring and control is established. Therefore, this article provides for the protection of persons over 18 years of age, but who are students of an academic lyceum or college, from forced labor[10, p.145].

In accordance with paragraph 18 of the plan of events, the Ministry of Labor and Social Protection of the Population, the Ministry of Public Education, the General Prosecutor's Office, the Council of Ministers of the Republic of Karakalpakstan, the regional and Tashkent city governors every year in August-October in order to prevent from compulsory labor of students of general education schools, it is necessary to conduct on-site monitoring and submit a detailed analytical report on the monitoring results together with relevant proposals to the Cabinet of Ministers. Therefore, the above-mentioned agencies should monitor the implementation of the legal norms that ensure that students are not involved in cotton picking. Citizens can directly apply to these agencies to complain about violations of the law. These agencies, in turn, should prepare a report on this and submit it to the Cabinet of Ministers.

## CONCLUSION

In conclusion, we can say that parents should pay attention to their children from a young age, find them something to do or make them apprentice to a craftsman to teach them a trade. It is necessary to teach our girls from a young age about chores such as gardening, cooking, housekeeping, child rearing, and self-care. So that they show that they are prosperous in the places they have visited, that they do not suffer in their new places, that their lives are prosperous and that their families are full. From time immemorial, our women have made a name for themselves in handicrafts, weaving, cooking delicious food, goldsmithing, embroidery and other crafts. They raised their daughters to become masters of several professions before marriage.

Ali Nazimov, a well-known enlightener who lived at the end of the 19th century and the beginning of the 20th century, gained great fame in Central Asia and was taught as a textbook in schools and madrassas. A science that is necessary and impossible not to learn is the science of handicrafts. Since even the highest knowledge and education cannot replace this science, young ladies and girls should try to learn this science. A woman who is a master of handicrafts can make a living in modesty and chastity due to the skill and dexterity of her hands. The ladies of rich

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families spend a pleasant and peaceful time behind their handicrafts, and they help the needy and become a humanitarian. The needle is a true and true friend, often a helper and one of the most valuable weapons

of the country's people. He comforts in lonely times, overcomes sadness, does good deeds, fights against poverty and poverty when necessary. Handicrafts should be taught systematically from childhood."

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