PHYSICAL HYDRAULICS MODEL AND COMPUTATIONAL FLUID DYNAMICS OF SG. BELIBIS PUMP SUMP

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by

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May ALLAH swt Guide Us All To Truth and Keep Us On The Straight Path…

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μ	Dynamic viscosity
$\cdot$	Inner product, a.b = a1b1 + a2b2 + a3b3
$c\mu$	k-ε model parameter (0.09)
D	Suction intake diameter
D_A	Suction intake diameter (bell mouth) for Bay 1 & 2
D_B	Suction intake diameter (bell mouth) for Bay 3 & 4
D_p	Internal diameter of the pump suction pipe (m)
F_r	Froude number
F_m	Froude model
F_p	Froude prototype
F_r	Froude ratio
g	Gravity
k	Turbulence kinetic energy
L	Length characteristic depending on water level
∇	Nabla operator
N_{rpm}	Number of rotations per minute
p	Pressure
Q	Flow rate
Q_r	Reynold's number
S	Submergence depth
t	Time
τ	Shear stress
TI	Turbulence

t_r	Time scales
U	Inlet velocity
u	Velocity
u'	Root-mean-square of the turbulence velocity fluctuations
U_r	Velocity scales
V	Velocity
ε	Turbulence dissipation
θ	Swirl angle
ν	Kinematic viscosity
ρ	Density

LIST OF ABBREVIATIONS

3D	Three Dimensional
ACIS	Andy, Charles & Ian's System
ADV	Acoustic Doppler Velocimeter
ANSI	American National Standard
ANSI/HI	American National Standard/Hydraulic Institude
BHRA	British Hydromechanics Research Association
CAD	Computer Aided Design
CFD	Computational Fluid Dynamic
FSI	Formed Suction Inlet
GUI	Graphical User Interface
h2O	Water-liquid
HI	The Hydraulic Institute
HWL	High Water Level
IGES	Initial Graphics Exchange Specification
JPS	Jabatan Pengairan dan Saliran
LCD	Liquid Crystal Display
MSMA	Urban Storm Water Management
NAHRIM	National Hydraulic Research Institute of Malaysia
NPSH	Net Positive Suction Head
PDE	Partial Differential Equations
PVC	Poly Vinyl Chloride
RANS	Reynols-average Navier Stokes
RKE	Realizable k-ε

RNG	Renormalization Group
SIMPLE	Semi Implicit Method for Pressure Linked Equations
SKE	Standard k-ε
SKW	Standard k-ω
SSTKW	Shear Stress Transport k-ω
TSS	Total Suspended Solids