

8 SGDMQJ VNH UHXDMRU IUDP HZ RUN IRU VNH GHMJQ
DQG FRQVWKFMRQ RI ZDMU VXSSO DQG VDQVDMRQ
V VMP V

2 0U 3UPLQ

0 R V F R Z V D B W H Y H B I & L L W L Q J L Q H H U E Q U R V O D W K R N V R H V F R Z
5 X V V L D

\$ E V M D F W 7 K H S D S H U G V F X W H V V N H D S H F W R I X S G D M Q J D Q G D S S U R D F K H V R
I P S U R Y L Q J V N H U H X D M R U D Q G V N F K Q L F D Q G R F X P H Q V L H & R G H V R I 3 U D F W H
& 3 V 6 V M 6 V D Q G E L G V * 2 6 7 V V R H Q K Q G F H V N H H I L F H C F R I G H J Q
F R Q V W K F M R Q D Q G R S H U D M R Q R I Z D M U V X S S O D Q G Z D M A Z D M U G L S R V D O
V V M P V L Q 5 X V M D Q F L W H V D Q G F R P P X Q M W V 7 K H G H Y H B S P H Q V R I D
P H M R G R U I I R U Z L V K L Q J R Y H U V N H V V M P R I U H X D M R U D Q G V N F K Q L F D O
G R F X P H Q V V R V N H S D U P H M F V D Q G E L G J D M R Q L V D Q D D J H G , W L V
G P R Q M D N G V D W V Q U F F Q V H Q V V N H 5 X V M D Q F R Q V W K F M R Q V F V A U K D V H V D
F R X U H I R U U H Y L V Q J D Q G X S G D M Q J V N H U H X D M R U I U D P H Z R U N L Q V N H I L H G R I
G H J Q D Q G F R Q V W K F M R Q V X X V U H G F L Q J V N H V D M A R U U H T X L U P H Q V L Q V N H
& R G H V R I 3 U D F W H 7 K H G H I L Q W R Q R I Y O U R X V P H M R G I R U M H G H Y H B S P H Q V
D Q G D S S O F D M R Q R I U H X D M R Q D Q G V D Q G E L G V L Q F R Q V W K F M R Q D U H J L Y H Q , V V
G P R Q M D N G V D W V N H S D Q Q G V D Q G V M R Q I U R P V N H S U H F U S M Y H U H X D M R Q
V V M P V R D S D U P H M F R Q H Z L W V S F L L F G T X D D W F U M J U D I R U V N H I L Q V K H G
S U R M F V L V D I P H G D V N H G H Y H B S P H Q V R I V N H T X D D W F U M J U D I R U V N H I L Q V K H G
S U R M F V R U S U R F W X L Q J D Q D O M L O D M Y H D S S U R D F K H V D Q G P H M R G
V D Q M H U U Q J D V L J Q L I F D Q V S D U V R I E X L Q L Q J F R G H V D Q G U H X D M R Q V R V N H
Y R O X Q M V F D M U R U (Y L G H Q D V F K D P H C G P H Q V V R V N H U H X D M R U
I U D P H Z R U N U H T X L U H D Y H U G H M L O G V F L H Q V L F D Q G S U D F W F D O X M V L F D M R Q

. H Z R L G V I P S U R Y P H Q V F R Q V W K F M R Q G H J Q L Q J U H X D M R U I U D P H Z R U N
V D Q G E L G V X S G D M Q J P H M R G

, Q W U R G X F W L R Q

7 H F K Q L F D O U H X D M R Q L Q V N H F R Q V W K F M R Q V F V A U P H Q Q V V N H Q J V N F K Q L F D O F K D U F M U M V F V
U H T X L U P H Q V D Q G I Q G F D M U V I R U M H R E M F V Y H V R I V N H V N F K Q L F D O U H X D M R Q V R V N D V P H H Q J V N P
H Q X U H V N H U H T X L U G I X Q F W R Q D O F K D U F M U M V R I V N H S U R M F W E D V H G R Q V N H U H T X L U P H Q V R I
V D H W U H D E L O M D Q G G U D E L O M > @

7 K H V V M P R I U H X D M R U G R F X P H Q V L Q V N H F R Q V W K F M R Q V F V A U L V D V H A R I L Q M U H D N G
U H X D M R U 0 U D O D Q G V N F K Q L F D O G R F X P H Q V L Q F R Q V W K F M R Q V D W F R Q M Q U H T X L U P H Q V U X O V
P H M R G R U I F D O R U S U H F U S M Y H S U R Y L R Q U H D M Q J V R Y O U R X V D S H F W R U U H X O V R I X U E Q

& R U U H V S M R G V M S H U # \ D Q G H U K

SODQLOJ LQFOXGLOJ EXWQRVOP LMG VR VHI SUHSDUNRO RI XUEDQ SODQLOJ GRFXP HQW
HQJLQHUIQJ VXYH V IURQVHGG HQJLQHUIQJ GHMJQ DUFKUMFUMDO DQG EXLOLOJ GHMJQ
FRQWAKFWRQ RSHUDNRQ FDSLVDUHSOLV UHFRQWAKFWRQ G-P RORNRQ DQG GLP DQLOJ RI FDSLVDU
FRQWAKFWRQ SURVFW DV ZHODV/EXLOLOJ P DAUIDY SURGXFW DQG WAKFUMH/LQWLP VRI VHI LU
XVHLQFRQWAKFWRQ> @

0 H W K R G V

,Q UHFQW HDV VHI 5 XVIDQ FRQWAKFWRQ VFRU KD/VH/D FRXUHI RUUHYLVLOJ DQG XSGDMQ VHI
UHJXONRU IUDP HZ RUN LQ VHI IILHG RI GHMJQ DQG FRQWAKFWRQ WAXV UHGXFLOJ VHI WDMARU
UHTXUHP HQW/LQVH&RGVRI 3UDFWH &3 > @

9 9 3XMQ 3UHLGQARI 5XVID FDUJHG VHI 5XVIDQ* RYHLOP HQVZ LK GUDWQJ SURSRDOYVR
VP SOI QFQLOJ SURFHGXU/LQ VHI FRQWAKFWRQ VFRU + HUYSRQ VHI* RYHLOP HQVGHG-GVR
UHYLVH RI 61L3V EXLOLOJ FRGHV DQG UHJXONRU/ WDM WDGEDUJ * 267V DQG RMPHU
UHTXUHP HQW 0 DUDV KXVKDQ ' HSNW3UHP H0 LQVMUR VHI 5XVIDQ* RYHLOP HQWMDINGWDM
VHI* RYHLOP HQWMDG DHDG UHSDDG D VLLG RI VHI WDMARU UHTXUHP HQW RI D GHFOLDYH
FKDUFWJ³ ZHKDYH UHSDDG VHI WDMARU UHTXUHP HQW UHMDINGVR 61L3VDG* 267V 7RQD
RXARI WFXDQG ZHKDYH WFXDQG WDMKDYH EFRPH UFRP P HQEDNRQ/ DQG DVIRU VHI
UP DLOJ WFXDQG ZHKDYH FRQLGHUHG DQG UHYLVH RI WHP VP SOI HG DQG DGSING
WHP DVFRVHD/SRWLEOHVR WHP RGHQUHTXUHP HQW \$ VHI VDP HWHP H ZHFRQWQXHZ RUNLOJ LQ
VILV GLUFWRQ SODQLOJ VR EULOJ P RUH WFXDQG UHJXONRU/ LQR FRP SODFH VLG 0
. KXVKDQ GXLOJ DPHWQ RI VHI 3UHLGQARI VHI 5XVIDQ) HGDUNRO 9 9 3XMQ ZLW VHI
* RYHLOP HQW @

+ RZHYU ZKDVGLG VHI GHMJQHV/JHV 5HSDOR DDP RWDQDQDQDQ 1 V 6DQW 1 RUP V DQG
5HJXONRU/ WDMVZHUH UHSDFG ZLW VR EDIF RQH/ RQ VHI VDIHW RI QYLOJ DQG ZRUNLOJ
FRQWAKFWRQ/ DQG RQ VHI UHTXUHP HQWIRUMH SURVFWRQRI VHIHQYURCP HQW/LP SOLEDMRQRI VHI
FKDQ RI DFRQV/ VR JHVSHP LW DQG DSSURYDQ HAV VHI DERONRU RI DDP RWW WDMARU
UHTXUHP HQW RI VHI FRGHV RI SUDFWH VSSRUMG EA ' HFUH RI VHI 5) * RYHLOP HQM R
LQVMDG RI VHI KRUVDYHG 5HROVRQ 1 R LQ DGGWRQVR VHI WDMQ/HUR DDP RWDQDQDQV/RI
VHI FRGHV RI SUDFWHVR VHI YROQDQV FDMURJ > @

' LFXWLRQ FRQWAKFWRQ DP RQJ VHI FRQWAKFWRQ LGGWV H SHUW UHMDINGVR VHI WDGEDUJ DNRQ
V WHP UHRUP

&XUHQD GIIHUQVPH HMRG/ IRU VHI GHYHSP HQW DQG DSSODNRQ RI UHJXONRU/ DQG
WDGEDUJ/LQVHI FRQWAKFWRQ VFRUKDYHEHQZ RUNGRVWURXCG VHI Z RUG) LWVRI DQWLV/LV
SUHFUSLYH P HMRG Z KLFK LV VHI VP SOWRQH + RZHYU QRQH RI VHI SUHFUSLYH UKOV FDUJ
VHSXLSRVHRI VHI UHJXONRU/ > @

) RUH DP SOI &3^{361L3} : DMUVSSO ([WMDQDQZ RUN/DQG
WAKFUMH/ WDMW/WDV³ VHI QJVR RI UHSDLVFWRQ/RI Z DMUSHQHV/KRXG EHDWJCHGDV
IROZV Z KLODQ LOJ Z DMUSHQHV/LQVR RUP RUHQHV DQGLQVHI DEVQHRI VZ LKLOJ QR
P RUHWQ NP' > @

+ RZHYU QRQH EXVMIH GHYHSHU RI VILV UHJXONRU NQRZV Z K VILV LV HYHQ VR 7KH
HJ HFXWRQ VFKPH Z LMLQ VHI SUHFUSLYH P HMRG LV DOR P QJ LP DQD HDX / LNH EXLOLOJ FRGHV
DQG VHI SURFHGXU IRU PHHWQ VHP LV DOR FRP SXORV \$ GG WDGEDUJ DNRQ LQ HAVQH
FRQVWV RI DQ HOP HQV/ HOP HQVGHVUSNRQ RI DFRQWAKFWRQ SURVFW/LQ DFRQDQGH Z LK
Z KLFK VHI VROVRQ/ GHMJQ/ P DAUIDY SHURUP DQHFKDUFUMUMV/ HAV DUHSUHFUEHG ,QRVHU
Z RUG/ EXLOLOJ FRGHV VMLQ LQR LQWAKFWRQ/ DV D UKH VHI FRQDQ GLUFWUMH HQFHV VR
WDGEDUJ/WDV/VEFRP HSUHFUEHG WDGEDUJ/> @

) XUMHU VHI SUDP HMF PHMRG KDV EHQ Z LGD SUDFWHG LQ HFRQPLFDQ GHYHSHG
FRQVMIH > @ 7KH Z RUG IDP RV IXCFWRQ RUIHQMG I QJ LEH UHJXONRU V WHP
³SHURUP DQFHEHV UHTXUHP HQW LQMSUHNG DV D³ SUDP HMF UHJXONRU P HMRG LV NQRZ Q
DOR LQ VHI SURHWRQDQYURCP HQW DQG LV RWDQHG DV IROZV VHI SUDP HMF UHJXONRU

P HMRG LV D P HMRG RI HMRG/KLQ UHXDRI UHTXUP HQV LQ FDH VHI HMRG/KP HQVRI
 REQDRI UHTXUP HQV DSSCH/RQD VR VHRSHUDRQD IXCFWRQD FQDUFMUMVRI VHRMFVR
 RI VFKQFDUHXDNRQ LQFOXGQ TXDQMMYHSDUP HMLV UHJLQDWRV LVGHMLJQDGGH FXMRQ
 > @

2 QR RI VHI DFMV/VH/LQFOXG-G LQ VHI' HYDSP HQ/VMDV/ RI VHRFRQMKFWRQLGGXVM DGG
 KRXLQJ DGG XMDV/VHFRU RI VHI5 XMDQ) HGUDNRQ I RUVHSHURGXQD ZLVK D I RUFDMV
 XQND LV VHIJLQDGDMDNRQ RI VHI FRQMKFWRQLGGXVM VR VHI SDUP HMF UHXDNRQ
 > @

, QVLU/UHJLQ VHI5) 0 LQVM RI &RQMKFWRQKDFXUHQD VHDFRXUHI RUMHMDQDNRQVR
 VHI SDUP HMF P RGHRI VDCDQJ DNRQ RI VHI UHXDRI IUDP HZ RUN LQ VHI FRQMKFWRQVFRU
 ZKHU VHI FUMJDI RUVH TXDQV RI VHI LQDSSURVFRUSURGXFDUHQHMF LQG VHI TXDQV FDQ
 EH HQXUHG VURXJK DQ DQMDYH DSSURFKH/DGG P HMRG/ 7KHJ LVMQ UHTXUP HQV
 HQDNG LQ VHI VDCDQJ ZLQD EH DGG VR VHI JHQD SDUP HMF RUIHQG IXCFWRQD
 UHTXUP HQV

7KH) HGUDQ\$ XMRP RXV, QMMNRQ³) HGUDQ&HQMU I R U5 HXDNRQ 6VDCDQJ DNRQ DGG
 7FKQFDQ(YDQNRQ RI VHI &RQ RUP LV LQ VHI &RQMKFWRQ, CGXVM')\$, ³) 56' GFQJG
 HMRG/KLQ D Z RUNQ JURXS RQ VHI VDCDQNRQ VR D P RGHRI VFKQFDUHXDNRQ LQ VHI
 FRQMKFWRQVFRU

7UDQDNRQ IURP VHI SUHFUSLVYH UHXDNRQ V VAP VR D SDUP HMF RGHZ LVK VSHUHG TXDQV
 FUMJDI RUVH LQDSSURGXFDV LQDSSURVGH I RUMDQV HUIQJ DVJLQ LFDQ/SDUPRI EXLQJ FRGH/DGG
 UHXDNRQ VR VHI FDMURV RI YRQDQV RGH/ VDCDQNRQ/6HJHL0 XJ\FKHQR ' HXW
 0 LQVM RI 5) &RQMKFWRQ DGG + RXVLQ DGG 8 VMDV/ 6HFRU GULQJ ³ 7FKQR/ALQ
) RJP > @

\$ FFRQJ VR VHI HJ SHU RI VHI 5) 0 LQVM RI &RQMKFWRQ LVVHP V DGYLDEH VR
 UHMFUMJEXLQJ FRGH/LQV VHGFRP HQVRI VUJHOMV

^{VW}OMH&RGV RI 3UDFVH &3 RI ³⁰ DQ 3URYLVQV/ WSH VMDV/LQFRQDQ VHI
 UHTXUP HQV VHRXVQ VHI I RUP RI VMDV VR HQXUH VDHV DSSUR LP DMD QZ &3V I LVM
 GHYDSSHGRQVHEDVRI DQP EHRI DFMQ &3V

^{QG}OMH&RGV RI 3UDFVH &3 RI ^{3'} HJQ 5XQV WSH LQ HDERUDNRQ RI VHI³⁰ DQ
 3URYLVQV/ ZLQFRQDQ P HMRG/ I RUP SDP HQDQ VHI UHTXUP HQV KHUF LVK VHIHP D EH
 VHIUDVFK &3V LQ HDERUDNRQ RI RQH³⁰ DQ 3URYLVQV ZKLFK LQFOXGH VHRHFRQDQJ
 DQMDYHP HMRG/ DSSUR LP DMD UHVLG&3VEDHGRQVHDFMQ RGH/

^{UG}OMH&RGV RI 3UDFVH &3 RI ^{3*} XLQDQ DQDQ VSH VMDV/UHGRVGLDEH VR EH
 LQFOXGH LQ VHI³ YRQDQV QV

, VV/SURSRVGH VMDV/VH) HGUDQ DZ RI ' HFP EHU 1) = D/DP HGGGRQ-XO
³7FKQFDQ5 HXDNRQ/RQ VHI6DHW RI %XLQJ V DGG6VFKMUV D/D³ VSHUHFHDMUH
 RI VFKQFDUHXDNRQ LQ FRQMKFWRQ LQ DGGNRQ VR VHI YRQDQV RGH LQNRGFH D
³UFRP P HQDRI ' QVMDV/LQFOXGHV&3,,,^{UG}OMH

, VV/RQEH GRMG VMDV/RQH RI VHI OMV DXP HV VHI DYDQDQV RI GLJMDSDUP HMLV
 , QVMDG VHIUH DUH JHQDSSURVLRQ/ VHI JRDV DUH I RUP XQDQ D VHI I LVMOMH VHI XCFWRQD
 UHTXUP HQV DUH I RUP XQDQ D VHI VFRQ OMH DGG VHI UHTXUP HQV I RUVH SHURP DQF
 FQDUFMUMVRI VHSURVFRVXEMFVGR VHI UHXDNRQ DUH D VHI VMLGOMH

%XLQJ UHXDNRQ/ EHQJ D VFKQFDQFRP SRQH/VRI VHI EXLQJ QZ ZLQEHREQDRI
 7KLV/LZ KHUHVHREQJLQHWRI VHI UHXDRI GRFP HQVHGG/

, QVHI5 XMDQ) HGUDNRQ VHI LXXHRI VDCDQNRQVR VHI SDUP HMF VDCDQJ DNRQ P HMRG LV
 VMD EDHG RQ VHI LQMDNRQD HJ SHUHQH DGG VDCDQNRQ/ I RUVH VXRUV 7KHURH
 SHULVMQDNP SV VR LQNRGFH D SDUP HMF P HMRG HOP LQDQJ DQ DSSURSU DMVMV LFDNRQ
 DGG FRQGLUQ VHI 5 XMDQ DFMQVMDNRQ LQ VHI FRQMKFWRQLGGXVM DUH XCFRQ/LQJ
 5 XMD FDCRVEH YLZHG VURXJK VHI SLP RI DQDQJ LQ VHI FXUHQV VAP VRI VFKQFDQ
 UHXDNRQ/LQVHI FRQMKFWRQVFRU LQFRXQMV/ZLVK GHYDSSHFRQRP LH/

, Q HFRQP LFDD GYHDSHG FRXQNIHV VNHGXFDNRQDDOYHDDGG OYLQ VDDGELV/LCFUHDVHG
JUDGDOD VNHFRQP\ EFDPHJGREDQ HG VFKCRQJLHV/GYHDSHGUDSLGD DGGDKXJHDP RXQV
RI EXLQLOJ P DMUDDV DGG SURGFW P RVRV VHP LQCRYDNYH EHJDDVRHQMUMHP DUNHW> @, Q
5 XWLDVNHVMDNRQKDV/EHQDDRFKQJLQJ EXVQRVNRUDSLGD

%HMGV 5 XWLD OFNV VFK VRODV RXUIRUHQJQ FRODDXHV KDYH LQ VNHIRUP RI 7HFKQFDD
6SHLLFDNRQ/ ZKHUH DDMH UHTXUHP HQV RI YROXQV VDDGELV/ EFRPH P DGGDMU IRU D
VSHLLF SURVFW

, WVKRXG EH GRMG VMDLQ 5 XWLD VNH V VAP RI UHXDMU GFRXP HQV LQ FRQWVFRQKDV
EHLQ LQIRUHVLCFH 8 QMD VLVV VAP Z DV/DVDDGELVIRUP DQ FRXQNIHV LQFOXGQJ
&KLD DGG UHP DQ/VR XQMDQRZ 21 FRXUH LVLV JUDGDOD FKOJLQJ +RZHYHU UHTQD VNH
QXP EHVRI GMLJQLQVMDNRQ/KDV/GFUHDVHG VNHQXP EHVRI VSHDDV DGG VNH TXDD LFDNRQ RI
JUDGDAM RI FLYLQHQJLQHUIQJ XQYHUVVH GRZ QJUDGH EHLGHV/VNHUZ RUN LQ VNHFRQWVFRQ
VFRUZ LK QR DFRXQVIRU VNH P DGGDMU SUHVUSMYH FRQWVFRQKDV DGG UHTXUHP HQV LV
VRFHZ KD/VWVXEDVPH 8 QYHUVV JUDGDAM DGG\ RXQJ SURHMLRQD VFRP LQJ VR UHSOHH VQ
DQGH LQ VNH VMDNRQ ZKHUH VNH DUH GRMDXJKV VNH KDYH QR SUDVPH QR RGH VR FRQXQV
VH VRRN DUH UJDD SXEDVHG RQVRE VDDQLOJ LV H VHP HD QP LMG (YLGHQ) VFK
DP HQGP HQV VR VNH UHXDMU IUDP HZ RUN UHTXUH D YHV GHMDGG VLFHQVLF DGG SUDVFD
MVV LFDNRQ

5 H V X O W V

&XUHQD XSGDMQ DFMQJ &RGV RI 3UDVPH DGG * 267V LV LQ SURJUH V, Q VR GRLQ VNH
IRQZ LQ P DQ &RGV RI 3UDVPH IRU VNH GMLJQ RI H VMDQDZ DMUVSSO V VAP V DGG KRXVH
SOXP ELQ KDYH EHQ XSGDMG &3 ³, QMLQDZ DMU VSSO DGG VHZ HUDJH RI
EXLQLOJ/ &3 ³61 L3 : DMU VSSO ([VMDQDZ QHZ RUN/ DGG
VWVFRQKDV DV ZHDDV/ &3 61 L3 ³6HZ HUDJH H VMDQDZ QHZ RUN/ DGG
VWVFRQKDV DGG D QXP EHVRI RMDU GFRXP HQV * 267 5 ³6\ VAP RI GMLJQ
GFRXP HQV IRU FRQWVFRQKDV 5 XOV IRU EDMF DGG GHMDGG HQJLQHUIQJ RI LQUDVWVFRQKDV
IDFLQVH : DMU VSSO DGG Z DMVZ DMU GVSRDD KDV/EHQ GYHDSHG DGG DSSURYHG E VNH5)
0 LQVW RI &RQWVFRQKDV

%HMGV * 267 5 ³6\ VAP RI GMLJQ GFRXP HQV IRU FRQWVFRQKDV 5 XOV IRU
EDMF DGG GHMDGG HQJLQHUIQJ RI KRXVH DGG H VMDQDZ QHZ RUN/ * 267 5

³6\ VAP RI GMLJQ GFRXP HQV IRU FRQWVFRQKDV 5 XOV IRU EDMF DGG GHMDGG HQJLQHUIQJ RI
KRXVH SOXP ELQ V VAP V DGG H VMDQDZ DMUVSSO QHZ RUN/ KDYH EHQ SXWQIRUHV> @

2 Q DSSURYDDUH * 267 ³: DMU VSSO 7HUP V DGG GH LQVFRQ/ UHVLVFRQ RI
* 267 * 267 6HZ HUDJH 7HUP V DGG GH LQVFRQ/ UHVLVFRQ RI * 267

7KH KDYH GRV EHQ UHVLVHG IRUP RUH VDDQ \ HQV / HFVUHV RI VNH GSDV HQV RI
: DMU 6XSSO DGG : DMVZ DMU ' LSRVDD RI VNH 1 DMRDD 5 HFDJK 8 QYHUVV RI &LYLO
(QJLQHUIQJ 0 * 68 VRRN SDVWQ VNH GYHDSHP HQV RI VNH H GFRXP HQV

+RZHYHU QXP HURXV LXXH/RI VNHZ DMU UHXDMU VMDQDZ DQ/VFRQVFRQ/ \$ CGLQVNV UHJ DGG RI
VSHDDGRMLV VNH LQDGH TXDF RI VNH UHXDMU IUDP HZ RUN LQUDVFRQVFRQ GMLJQLOJ V VAP V IRU
VNH VUJDFHXQR I GVSRDD DGG VHDV HQV/652 > @

6XUJDFHXQR I JHCHDMG RQ VNH VMDNRQ RI FVNV DGG FRP P XQVNV LQ 5 XWLD LV DQ LQDMQYH
VRUHV RI VFKQRJHGF SROXNRQ RI Z DMU ERGHV ' HMURUDNRQ REVROMVCFH RI VAP VHZ HU
QHZ RUN/ DGG VHDV HQV DFLQVH/LQ P RV 6 XWLDQ FVNV/FDXVHDJURZ LQJ QHGI RUUFRQWVFRQKDV
XSJUDGH ZKHUV LQ D QXP EHVRI FVNV VNH FRQWVFRQKDV RI QHZ QHZ RUN/ DGG VHDV HQV
IDFLQVH/LV QHGHGEFDXVRI VNH OFN RI FQMDQ HG LSRVDD VUJDFHXQR I

\$ FFRQLOJ VR H SHVRSQRQ LQ VNH ILHG RI VUJDFHXQR I P DQJHP HQV VVFDQV IRU VNH
IP SURYHP HQV DGG GYHDSHP HQV RI LQCRYDNYH VFKCRQJLHV P DMUDDV DGG VHDV HQV VTXLSP HQV
VR SUHYQV SROXNRQ RI VNH QMDDHQV LURQ HQV LQFOXGQJ Z DMU ERGHV E VEVDDVH RI

P DQ P DGH RUI LQ DFFRXQMQJ RI VNH DP HQCP HQM VR VNH UHXDMRU I UDP HZ RUN I RUM HGHLJQRI
 VXUDFH UKCRI GLSRVDDGG WHDV HQM VMP V DV Z HQDV LQ VNH5) HQMURCP HQMDDGG Z DMU
 QULVDMRQ/VNDVUHXDMR VNH GLVKDJH/RI SRODMQV LQ/RZ DMUERGHV 7 KLV/LV DMDQVNRQI URP
 VNH DSSDFNRQ RI ILKHV WDDGEGV 0 3&, v VR VNH UHXDMRQ RI GLVKDJH/ EDVHG RQ VNH
 SHURUP DQFH LGGFDALV/RI VNH EHWDYDQDEH VNFKRCRUIHV %\$7 \$ QG DFFRLGQJO LVFDQVIRU
 VNH DGMVVR HQMDDGLQVRP HFDVH DP HQCP HQM VR VNH UHXDMRU DQG VNFKQFDQGRFXP HQM LQ VLV
 DJD> @

7KH DQDQV/ RI VNH FXUHQV5)) HGUDQ/ DZ V UHXDMRU VNFKQFDQDQG P HNRGRUIFDQ
 I UDP HZ RUN I RU VNH GHMJQ FRQVNFVRQ DQG XSDUDH RI VXUDFH UKCRI GUDQJH DQG WHDV HQM
 V VMP V LQ FRP P XQVHV DQG XUEDQ GLVNFV JLYHQ LQ > @ V KRZ HG VMDVDSUHVHQVZ KDH
 GHMJQJ VXUDFH UKCRI P DQJHP HQM VMP V VRP H SURYLVRQ/ GRVUHXDMRGE VNH QZ DTRUG
 JURXQG VR VNH ERGHV/RI VNH 6VDM ([SHUWH DQG VNH) HGUDQ LKHUHV \$ JHQF I RUUHVNFQJ VNH
 DSSURYDO RI VNH SURVFWGRFXP HQMNRQ I RU VNH LP SDF HQMNRQ RI DFWVNFV RQ FDSVDD
 FRQVNFVRQ SURVFW

7KH P DQ UHVRQ I RU VNH UHVNFVRQ LV VNH EDQ RQ GLVKDJLQJ Z DVAZ DMULQR Z DMUERGHV
 Z LVNFVMDQ VDDQV SXULFDNRQ RU GHVMDQJ DNRQ SURFHGLQJ IURP VNH LP SHU LVWELDW RI
 HJ FHHGQJ VNH GRUP V RI DFFSDQEH LP SDFWRQ Z DMU ERGHV DQG P QJ LP XP SHU LVWELQ
 FRCP QMDNRQ/RI SRODMQV LQ Z DMUERGHV/RUMNFKRCRUIFDQWDDGEGV FRQMLQGHQSDUDJDSK
 3DUV \$ UNFQI RI VNH5) : DMU&RGH> @

7KH SURYLVRQ/ DQG RI &3 36113 i ' 6HZ HUIJH
 ([VUDD QHZ RUNV DQG VNFVNFV DOR IHQXGHU VNH EDQ 7KHV SURYLVRQ/ LGGFDAM VNH
 IROZ LQJ

VNH P RVNFQMP LQDAG SDUVRI VXUDFH UKCRI JHQHIDAG GULQJ VNH SHURV/RI UHQ DQ
 P HQVJ VGRZ DQG KJJKZ D Z DVKQJ VDDQEH UHP RYHG VR VNH WHDV HQM DFLQVHV LQ DP RXQVRI
 P LQP XP RI VNH DYHUIJH DQDQDOYROP HRI VXUDFH UKCRI RI VNH V WSH DQGR VNH HQVH
 DYHUIJH DQDQDOYROP HRI VXUDFH UKCRI Z DMU/RI VNH Q WSH LMP

VXUDFH UKCRI GLSRVDDQ VMP VRI VNH V WSH DQDQDOYROP HGVR GLVKDJH SHDN IROZ VRI KHY
 UHQ Z LVK DQ LQMQV HJ FHHGQJ VNH FDDXQDAG RQH LQAR DZ DMUERG KRZ HYU QVWMDQ
 RI VNH DYHUIJH DQDQDOYROP HRI VXUDFH UKCRI FDXVH + HJZ LVK LVV/FQDURHJ SHUWMDV
 VNH GLVKDJHRI VMLP Z DMUGULQJ LQMQV HUIJH DQV DTRUHG VNFKQFDQDQVNRQ DQG VNH EDQ RQ
 VNH GLVKDJHRI VXUDFH UKCRI XGHUHJ WHP HFRQVNRQ/ FQGRVH FRQLGHUHG DV VNH GRUP ,Q
 VLV FDXH LVLV TXVH REYLRXV VMDVNV 3DUV \$ UNFQI RI VNH5) : DMU&RGH VMDVWDDQEH
 UHVLFHG DQGRV&3 > @

, VLV GRVZ RUM VMDVDSUHVHQV DQGHMJQ HQJLGHV LQ VNH FRQV Z KDH SHURUP LQJ
 K GUDQF FDDXDMRQ/RI VXUDFH UKCRI GLSRVDDQ VMP V XV³ RAXDAG FOP DMF SDUP HMLV
 \HV RQ 8 SGMQJ FOP DMF SDUP HMLV XVHG I RU K GUDQF FDDXDMRQ/ LQ VNH SURFHV RI
 GHMJQJ VMLP VZ HV/E VNH³ QP LVQMQV P HNRG DQG GHYHBSLQJ HQJLGHUQJ P HDXVH
 VR DQDQV VNFKQJH/LQVMLP Z DMUFDDVNRQ DQG GUDQJHV VMP VDUIHTXUHG

7KH XVH RI XSGDAG FOP DMF SDUP HMLV LQ K GUDQF FDDXDMRQ/RI JUDVW QHZ RUN Z LQ
 SURYLGH I RULGFUHDQJ VNH GLVKDJH FDSFLV RI VNH VMLP VZ HV/DQG LQ FDXHRI VKRZ HUIJQ/
 SUHYHQJ VNH GP DJHIURP IORGLQJ RI XUEDQJHV

& R Q F O X V L R Q V

5 H HQ VNH5 XMDQ FRQVNFVRQ VNFVUJQV/VHD FRXUHV VRZ DLG/ UHVLVQJ DQG XSGDMQ VNH
 UHXDMRU I UDP HZ RUN LQ VNH I HQRI GHMJQ DQG FRQVNFVRQ Z LVK VNH SXLSRVHRI UHGFLQ VNH
 P DQDQV UHTXUHP HQM LQ VNH &RGH/RI 5 H XDMRQ/

7KH SDDQGH WDDQVNRQ IURP VNH SUHVNFV VNH WDDGEGJ DNRQ V VMP VR D SDUP HMF RQ
 Z LVK VSHUHG TXDQV FUMJDI RUMH I LQDQ SURGFVW/DLP HG DV GHYHBSLQJ VHTXDMV FUMJDI I RU
 VNH I LQDQ SURVFWRU SURGFVWV LQ DQ DQMDQVH DSSURFHV DQG P HNRG/ WDDQV HUIJQ D
 VJQILFDQ/SDUVRI EXLQJ FRGH/DQGUHXDMRQ/VR VNFDAURV RI YROQV RQH

,QVH5XWLDQ) HGUDNRQ VZ LVKIQ VRVHSDUP HMF VDCEDGJ DNRQP HMFGLVEDVGRQ
 VHLQANCDNRQDOH SHUHCFH DGGVDDQDNRQ/RI TRUHQVXRUFHVRIDU5XWLD FDCQVHHLHZHG
 VURXJK VHSUMP RI DGD) LQ VHFUHQVW VMP VRI VFKQFDDUHXDNRQ/LQ VHFRCQVAFNRQ
 VFVRLQFRXQNHVZ LVK GHYGSHGHFRCP LHV

7KHVDDQVNRQVRDSDUP HMF PRGCR VDCEDGJ DNRQRI VHUHXDNRU IUDP HZ RUNLQVH
 FRCQVAFNRQ VFVRURI VHSXWLDQ) HGUDNRQ UHTXUHV VLFQVLF NVVWVLFNRQ DGGFRQLGHUDNRQ
 RI VHSFLLEV DGGDFVDDQVNRQLQVHFRCQVAFNRQLGGVWV DGGVRF LR HFRCP LF VDDNRQLQ
 5XWLD

,WV SURSRVHG VR IXUMHUXSGDM VHV VMP RI VHUHXDNRU GRFXP HQV LQVHILHG RI
 GHVJQ FRCQVAFNRQ DGG RSHUDNRQ RI ZDMVSSO DGGZ DVNZ DMUV VMP VXLQ VHFUHQV
 VAFVUHRI VHUHXDNRU IUDP HZ RUN

5HIHUHQFHV

)HGUD/ DZ RI VHSXWLDQ)HGUDNRQ1R)/ ³2Q7FKQFDDU5HXDNRQ GDAG
 ' HFPFHU

)HGUD/ DZ RI VHSXWLDQ)HGUDNRQ1R)/ ³7FKQFDDUHXDNRQ³2QVHVJHW
 RI EXLQV/DGGVAFVUH/ GDAG' HFPFHU

7RZQ3DQQJ &RGHRI VHSXWLDQ)HGUDNRQ GDAG' HFPFHU 1R)/
 HG GDAG\$ SUO 0 RFRZ

85/ KMS VUHVUXSUHV F HQVGRVWREJ RUJ P HQQVY « DFFWHG

85/ KMS UHVVUEF UK DFFWHG

)HGUD/ DZ RI VHSXWLDQ)HGUDNRQ1R)/ ³7FKQFDDUHXDNRQ³2QVHVJHW
 RI EXLQV/DGGVAFVUH/ GDAG-XO

)HGUD/ DZ RI VHSXWLDQ)HGUDNRQ1R)/ ³7FKQFDDUHXDNRQ³2QVHVJHW
 RI EXLQV/DGGVAFVUH/ DSSURYG E GFUHR VHV* RYHCP HQVRI VHSXWLDQ)HGUDNRQRI
 0 D

&3 ³⁶¹L3 : DMU6XSSO ([VDDOCHZ RUN/DGGVAFVUH/
 . ROENRY \$ 1 3DUP HMF VDCEDGJ DNRQP HMF & RQVDDQVGLYH VR FKQJHV \$92.

' H0RHO+ \$HV - & + (IHVRI XCFHVDQV LQ DGG XH GEP DJH PRG-IV DGG
 LQCGDNRQGSKRQI GRG GEP DJHHVW DNV 1 DMUD+ DJ DGV ±
 -RQIPDQ% . UHEFK+ \$SH+ % %DM/3)HQ/ * HUFH\$ HVDO & RP SDUDVH
 I GRG GEP DJH PRG ODVHVP HQV 7RZ DGV/D (XURSHDQ DSSURDFK 1 DMUD+ DJ DGV DGG (DVK
 6FLHQFH ±

%JHV/5 &)URP VDGVRQDOUH LQUDVAFVUH VR EOXJUH HQ LQUDVAFVUH / RGRQ
 3DDUDYHO DFP LDDQ8.

6HVNK: 6VDCEDGJ DNRQV VMP LQVHZRUG± IURP SUHFUSVHVP HMF VR SDUP HMF
 RQH \$ UNKLVNQ L3HNVXJ

6VDMV TRU VHGHYGSP HQVRI VHFRCQVAFNRQLGGVWV DGG KRVLQ DGG XWNVH
 LQUDVAFVUH RI VHSXWLDQ)HGUDNRQ TRU VHSURGXQND ZLVKDIRUFDVXQND
 DSSURYG E 2GHURI VHV* RYHCP HQVRI VHSXWLDQ)HGUDNRQ GDAG2 FVHFU 1R
 U

85/ KMS VURP SURVR PVUHQZ VURVWNVWVWRVW SBNV DFFWHG
 85/ KMS DVKSHVU%KVKLY SURHVWV DFFWHG

&3 ³²SHUDNRQ RI VHSXWLDQ)HGUDNRQ1R)/ ³7FKQFDDUHXDNRQ³2QVHVJHW
 V VMP VDCQVAFVUH/

* 267 5 ³⁶\ VMP RI GHVJQGRFXP HQVNRQIRUFRCQVAFNRQ 5XOVIRUEDMF
 DGGGHVDDGHQJLGHUQ RI LQUDVAFVUHIDVWV : DMU6XSSO DGGZ DVNZ DMUGVSRDO

* 267 5 ³⁶\ VMP RI GHVJQGRFXP HQVNRQIRUFRCQVAFNRQ 5XOVIRUEDMF
 DGGGHVDDGHQJLGHUQ RI KRVDGCH VDDOCHZ HUCHZ RUN

* 267 5 36\ WAP RI G-MJQGRFXP HQDMRQIRUFQWKFWRQ 5XOMIRUEDMF
 DQGGHMGGHQJLQHUIQ RI KRXVHSOP ELQ V WAP V DQGH MUCOZ DMUXSSO QHIZ RUN/
 9HUHMKQJLQD/ 0 6DQCEUG/IRUG-MJQJ V WAP VIRUVMHUP RYDODQG WHDM/HQVRI
 VXUDFHUXQRI DQG XQHMHG UHTXUHP HQVRI WHZDMUSURMFWRQ @ULVDMRQ 9RGRVDEJ K-QHL
 6DQWUCDD7HNKQND
 . XJTP LFK 91 0 LDU (* 2 Q VMH QHG IRU PDNQ DP HQGP HQVRI VMH VDMRUJ
 UHJXDMRQRI LP SDFVRI VMHEXVGHVRSUDMRQ/DQGRMUDFVMVVRQVMHVXUDFHZDMUERGH/
 9RGRVDEJ K-QHL6DQWUCDD7HNKQND
 : DMU&RGHRI VMH5XWLDQ) HGHDMRQ D/DP HQGGRQO D) HGHDDZ 1 R
 DSSURYGEA ' HFUHRIMH* RYHCP HQVRI VMH5XWLDQ) HGHDMRQRI -XO